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COMORBIDITY IN CONTEXT: IDENTIFYING PATTERNS OF DEPRESSIVE AND
ANXIETY SYMPTOMS IN AFRICAN AMERICAN EARLY ADOLESCENTS

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy at Virginia Commonwealth University

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Abstract

Comorbidity in context: Identifying patterns of depressive and anxiety symptoms in African American early adolescents

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2020

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Depression and anxiety during adolescence includes symptoms of irritability, sleeplessness, feelings of guilt or worthlessness, worry, avoidance, and/or restlessness. Anxiety and depressive symptoms are often comorbid and are associated with impairments across academic, social, and emotional areas of functioning. No studies to date have examined patterns of depressive and anxiety symptoms together for African American adolescents using person-centered analyses. The current study examined patterns of symptoms and domains of anxiety and depression during early adolescence using latent profile analyses (LPA). A sample of 196 African American early adolescents in grades six through eight ($M_{age} = 12.6$; 50% female) were used for analyses. A three-profile solution that identified a Low-severity group, a High externalizing/moderate school and social evaluation difficulties group, and a High social evaluation and physiological/sleep problems group. Significant patterns of relations with positive school interpersonal relationships (e.g., student-teacher relationships and student-student relationships) and emotion regulation difficulties (e.g., anger emotion regulation coping, anger inhibition, anger dysregulated expression) were also found based on profile membership. Understanding how patterns of

depressive and anxiety symptoms present for African American youth during adolescence is crucial to the conceptualization, treatment, and prevention of anxiety and depression using culturally sensitive approaches.

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Comorbidity in context: Identifying patterns of depressive and anxiety symptoms in African American early adolescents

Adolescence is a developmental period characterized by changes across contextual, biological, cognitive, and social-emotional domains which influence youth in complex ways (Steinberg, 2008). During secondary school, adolescents are coping with puberty and the increased demands related to academic achievement, organizational skills, and independence (Trickett & Moos, 1973). Adolescents are faced with a social environment where parental monitoring of peer activities decreases and reliance on peers and non-parental adults for support increases (Roeser, Eccles, & Sameroff, 2000). They are navigating these new social paradigms and learning to better understand the interplay between their thoughts, emotions, and behaviors (Roeser et al., 2000). Adolescents can experience challenges during this timeframe, and racial/ethnic minority youth who live in urban, low-income environments are at risk for increased mental health difficulties, including higher rates of internalizing symptoms (Franko et al., 2005; Kessler, Avenevoli, & Merikangas, 2001).

African American youth are overrepresented in under-resourced communities and neighborhoods characterized by poor quality schools, and limited access to healthcare, jobs, and advantaged social networks (Firebaugh & Acciai, 2016). Living in high-poverty neighborhoods results in inequality of opportunity due to diminished life chances for residents and greater exposure to crime, noise, and congestion which implies a lower overall quality of life (Firebaugh & Acciai, 2016). African American youth living in under-resourced communities are disproportionately exposed to certain risk factors, such as poverty and community violence, which are associated with the development of common mental health disorders and their adverse consequences (Campion et al., 2013; Melzer et al., 2004; Patel & Kleinman, 2003; Patel et al.,

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2010; McLoyd, 1990; Cooley-Quille et al., 2001). Specifically, adolescents residing in areas of low socio-economic status (SES) are at an increased risk for depressive and anxiety symptomatology and this distressing impact of contextual-level socioeconomic disadvantage in childhood can be sustained into young adulthood (Aneshensel & Sucoff, 1996; Brooks-Gunn et al., 1993; Goodman et al., 2003; Leventhal and Brooks-Gunn, 2003; Wickrama & Chalandra, 2003; Wight et al., 2005). The prevalence of depressed mood or anxiety has been shown to be 2.5 times higher among youth aged 10-15 living in poverty (Lemstra et al., 2008).

Stressful conditions, such as racism, which affect marginalized groups more, may lead to increased susceptibility of African American youth to poor health outcomes (Link & Phelan, 1995; Roosa & Gonzales, 2000). Racism and discrimination are fundamental aspects of the current social structure and are pervasive stressors in the daily lives of many racial and ethnic minority individuals (Patcher et al., 2010). They can negatively impact health outcomes and limit opportunities to access institutions that support wellness (Dressler, Oths, & Gravlee, 2005; Gee & Payne-Sturges, 2004). Racism has been linked to depressive and anxiety symptoms (Seaton et al., 2008; Yip, 2015) and racism can create discrepancies in SES that can lead to a) differential health outcomes, b) differences in the quality and quantity of medical care, c) adverse effects on physiological and psychological functioning, and d) poorer academic motivation and achievement (Williams et al. 1994, Clark et al. 1999; Chavous et al. 2008; Powell and Arriola 2003). Overall, the interpersonal and structural stressors faced by African American youth living in under-resourced neighborhoods increase their risk for anxiety and depressive symptoms. This highlights the importance of focusing on the current study sample to better understand the structure of depressive and anxiety symptoms and intra-group similarities and differences in the pattern of these symptoms.

Depressive Symptoms during Adolescence

Symptomatology. Depression during adolescence and throughout the lifespan has been conceptualized as a mood, a syndrome, and a disorder. The term “depression” in studies of children and adolescence has been used to identify depressed mood (Hammen & Rudolph, 2003). Depressed mood is defined as general feelings of sadness, irritability, and dysphoria. Depressive syndromes include a set of symptoms that have been shown to co-occur based on empirical data. Common symptoms within a depressive syndrome include dysphoria, irritability, weight loss or gain, pervasive anhedonia, sleeplessness, psychomotor agitation or retardation, fatigue, feelings of guilt or worthlessness, suicidal thoughts or behaviors, or concentration problems. For African American youth, differences in depressive symptom presentation have been identified. African American youth are less likely than white youth to endorse sadness and decreased energy symptoms and may show more anger, aggression, and irritability (Choi & Park, 2006; Iwata et al., 2002). Other studies have found similar support for increased endorsement of externalizing/oppositional behavior dimensions of depressive symptoms among African American/Black youth compared to European American/white youth (Politano, Nelson, Evans, Sorenson, & Zeman, 1986). In order for a depressive disorder to be diagnosed based on criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-V; American Psychiatric Association, 2013) and the International Classification of Diseases (ICD-10; World Health Organization, 1996), adolescents must have a minimum number, duration, and severity of the symptoms described above. In addition, these symptoms must be causing clinically significant impairment in social, occupational, or other areas of functioning (APA, 2013).

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Prevalence. Roughly 20% of youth experience the onset of depressive symptoms in early adolescence that can last well into adulthood (Kessler et al., 2001). In a study that asked adolescents to rate the presence and severity of symptoms that they experienced while at school, depressive symptoms rates were closer to 30-40% among predominantly white youth (Brendgen, Wanner, Morin, & Vitaro, 2005). This highlighted that a substantial percentage of adolescents experienced depressive symptoms when in the school environment. Study findings for relative risk of depressive symptoms for African American youth compared with white youth are mixed (Brown, Meadows, & Elder, 2007; Kennard, Stewart, Hughes, Patel, & Emslie, 2006). One study found that African American boys reported higher levels of depressive symptoms on the Children's Depression Inventory (CDI) than did white boys, but they did not find racial differences for girls (Kistner, David-Ferdon, Lopez, & Dunkel, 2007). Even so, these patterns are not always supported after considering additional risk factors such as socioeconomic status (Kennard et al., 2006; Mikolajczyk, Bredehorst, Khelaifat, Maier, & Maxwell, 2007). For example, statistically significant differences between reports of depressive symptoms may be largely due to socioeconomic variables rather than ethnic differences such that SES acts as a confounding variable (Kennard et al., 2006). Longitudinal studies that examined the stability of depressive symptoms over time using diverse samples found evidence for the high stability of symptoms and noted that the best predictor of later depression was the occurrence of a previous depressive episode (Cohen et al., 1993; Cole, Martin, & Powers, 1997).

Consequences. Depressive symptoms are associated with a wide variety of concurrent problems that can be highly debilitating for adolescents. These symptoms negatively impact an individual's thoughts, feelings, and behaviors and can have a significant detrimental influence on the ability to care for oneself. Depression can cause additional stress for adolescents by

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interfering with the achievement of key developmental tasks (e.g., academic achievement, negotiating changes in family relationships, and establishing peer networks) and may even compromise neurobiological development and increase sensitization to future stress, depression, and other psychopathology (Rao & Chen, 2009). Motivational deficits and concentration difficulties can lead to serious academic problems (Kovacs et al., 1984). Social withdrawal symptoms can impair interpersonal relationships (Kovacs et al., 1984) and this resulting impairment has been found at multiple time points across childhood and adolescence, including fourth grade and later in middle and high school (Moskowitz, Schwartzman, & Ledingham, 1985). Depression can put adolescents at risk for later substance use disorders (Rao, Ryan, Dahl, et al., 1999) and bipolar disorder (Geller, Zimmerman, Williams, Bolhofner, Craney, 2001; Strober & Carlson, 1982). Over half of adolescents with depressive mood disorders presenting during early adolescence make a suicide attempt at some point in life and around 22% have multiple attempts (Weissman et al., 1999).

Anxiety Symptoms during Adolescence

Symptomatology. Anxiety symptoms during childhood and adolescence are similar to depressive symptoms in their differential classifications of mood, syndrome, and disorder. Anxiety is a basic human emotion that is characterized by a diffuse, uncomfortable sense of apprehension, and is often accompanied by a physical autonomic response (Barlow, 2002). Anxiety serves an evolutionarily adaptive function aimed at alerting individuals to novel or threatening situations and is an integral part of normal developmental progression from dependency to autonomy. Anxiety tends to present earlier in childhood than depression and levels off around early adolescence (i.e., around age 12; Merikangas et al., 2010). Examples of normal anxiety during childhood include separation from caretakers, the first day of school, and

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adjustment to darkness (Albano, Chorpita, & Barlow, 2003). Normative levels of anxiety during adolescence are also present during situations such as learning to drive, or during a first date or job interview (Albano et al., 2003).

Anxiety syndromes or disorders can be distinguished from mood based on the pervasiveness of fear and avoidance, degree of interference in an adolescent's daily functioning, and intractability of the anxiety (Albano et al., 2001; Barrios & Hartmann, 1997). Common symptoms with an anxiety syndrome include cognitive (e.g., unwanted thoughts, harsh self-criticism), somatic (e.g., muscle tension, sleep disturbance, restlessness), behavioral (e.g., avoidance/escape from an anxiety provoking situation, difficulty concentrating) or emotional (e.g., dread, irritability) symptoms (APA, 2013). For African American youth, anxiety symptom presentation tends to be expressed in the form of physical/somatic symptoms (Barbarin & Soler, 1993). In a study by White and Farrell (2006), a large proportion of the sample of predominantly African American youth endorsed headaches (40%) and abdominal pain (36%) that were associated with increased anxiety across a six-month period. Other studies have also found support for somatic symptom endorsement serving as a potential risk factor for later anxiety in African American youth (Kingery et al., 2007; Kirmayer, 2001). Based on the DSM-5, adolescents can be diagnosed with an anxiety disorder if they: (a) display excessive anxiety and worry more days than not for the last six months about a number of activities, and (b) have difficulty controlling the worry in conjunction with at least one other symptom (i.e., restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, or sleep disturbance) that causes clinically significant impairment in social, occupational, or other areas of functioning (APA, 2013).

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Prevalence. Anxiety is the most prevalent form of psychopathology in youth with roughly 30% of youth being diagnosed with an anxiety disorder (Merikangas et al., 2010). Rates of diagnosis are slightly higher among children ages 6-12 (ranging from 7.1% to 28.2%) compared to adolescents ages 13-18 (ranging from 10.3% to 12.2%) (Vasey, Bosmans, & Ollendick, 2014). Similar prevalence rates of anxiety symptoms have been found for African American youth although more research in this area is warranted based on the low number of studies that have reported prevalence rates for community samples of adolescents (Angold et al., 2002; Lewis, Byrd, & Ollendick, 2012). Studies generally support the stability of any anxiety disorder over time though this is not always the case at the individual diagnosis level (Costello et al., 2011; Whiteside & Ollendick, 2009). Evidence exists for continuity of specific anxiety disorders from childhood to adolescence; however, most childhood disorders resolve or evolve into another disorder, and thus have not been found to consistently persist into adulthood (Costello et al., 2011).

Consequences. High levels of anxiety have the strong potential to interfere with normative development of children and adolescents. Impaired interpersonal and academic functioning are maladaptive outcomes common across adolescents with anxiety or depression difficulties (Rapee, Schniering, & Hudson, 2009). Impairment that occurs early in development, as is often seen in the case of anxiety, can have the capacity to initiate negative developmental cascades (e.g., biological, temperamental, and cognitive biases may lead children to have a low sense of control and view anxiety as dangerous and feel incompetent to cope with threatening situations). Significant anxiety symptoms or anxiety disorders can persist over time and carry risk for other disorders, particularly depression, in adolescence and adulthood (Rapee et al., 2009).

Comorbid Depression and Anxiety during Adolescence

Prevalence. Comorbidity, or the co-occurrence of depressive and anxiety disorders in children and adolescents has been well documented (Brady & Kendall, 1992; Mineka, Watson & Clark, 1998). Based on the National Comorbidity Student-Replication (NCS-R), 59% of individuals diagnosed with a depressive disorder had a lifetime diagnosis of an anxiety disorder as well (Kessler et al., 2003). An earlier review by Clark (1989) similarly found that 56% of individuals with depressive mood disorders have a lifetime anxiety disorder, and individuals with an anxiety disorder diagnosis reported comorbidity rates between 20% to 63% with depressive disorders. Most research has shown that the onset of anxiety disorders often occur prior to the onset of depressive disorders in youth and adults (Kovacs & Devlin, 1998). Younger children tend to present with anxiety only, while older children and adolescents tend to show comorbidity and present as more symptomatic and impaired (Albano et al., 2003).

Studies looking at subthreshold or subclinical symptoms (i.e., below the cut-off for meeting full diagnostic criteria of a disorder; Guberman & Manassis, 2011) have found that subthreshold symptoms of depression are highly comorbid with subthreshold symptoms of anxiety but not comorbid with any other subthreshold or threshold disorders (e.g., eating disorder, substance use disorder, conduct disorder, ADHD; Lewinsohn, Shankman, Gau, & Klein, 2004). Subthreshold anxiety symptoms have been found to predict a higher likelihood of subthreshold depressive symptoms and disorders (Lewinsohn et al., 2004). Better understanding the subthreshold comorbidity between depression and anxiety symptoms is an important area for further research, particularly due to findings showing that subthreshold symptoms present similar outcomes, comorbidities, and pathways to comorbidity when compared to findings of depressive and anxiety threshold disorders (Angst, Merikangas, & Preising, 1997).

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The high prevalence of comorbidity between these two mood disorders suggests an overlap between the latent constructs of depression and anxiety (Hammen & Rudolph, 2003). Some researchers have offered hypothetical alternative frameworks for explaining specific and common features of the two disorders. The tripartite model of depressive and anxiety symptoms (Clark & Watson, 1991) posits that the common feature of anxiety and depression is negative affect (e.g., psychological distress, negative mood) and suggests that anhedonia (e.g., apathy, loss of pleasure, hopelessness) is specific to depression while physiological hyperarousal (e.g., panic, nervousness, tension) is specific to anxiety. One such study supporting the tripartite model found it to be a valid representation of anxiety and depressive symptoms in African American youth (Gaylord-Harden, Elmore, Campbell, & Wethington, 2011). It is possible that the comorbidity between anxiety and depressive symptoms stems from limitations in the definition of diagnoses within current diagnostic classification systems (e.g., DSM-5, ICD-10) and the measurement tools used for diagnosis (Connolly, 2007). For example, the existing overlap between shared symptoms of depression and anxiety (e.g., restlessness, fatigue, concentration problems) may be one such diagnostic shortcoming that provides an argument for viewing depression and anxiety using a dimensional perspective (e.g., one that allows individuals to differ based on patterns of anxiety and/or depressive symptoms) rather than a diagnostic perspective (Hammen & Rudolph, 2003).

Consequences. The co-occurrence of anxiety and depression in youth has been associated with more severe impairment and increased risk of suicidality than either cluster of symptoms in isolation (Foley, Goldston, Costello, & Angold, 2006; Franco, Saavedra, & Silverman, 2007; Last, Hansen, & Franco, 1997; Manassis, & Hood, 1998; Manassis & Menna, 1999; Masi, Favilla, Mucci, & Millepiedi, 2000; Masi, Mucci, Favilla, & Millepiedi, 2001;

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Nottelmann & Jensen, 1995; O’Neil, Podell, Benjamin, & Kendall, 2010). Comorbid anxiety and depressive symptoms during adolescence have been associated with academic problems, failure to seek mental health treatment, and increased risk of suicide when compared to purely depressive or anxious symptoms (Lewinsohn, Rohde, & Seeley, 1995). These adverse effects may be compounded by increased difficulties with access to care for African American youth and their families living in under-resourced neighborhoods which result in heightened health disparities (Katz, 2001). Increased family dysfunction has also been associated with comorbid depression and anxiety though it is unclear whether family dysfunction stems from family member responses to youth with co-occurring anxiety and depression or whether it is a risk factor (Guberman & Manassis, 2011). There is limited research examining the impact of comorbid subthreshold symptoms of anxiety and depression in youth (Guberman & Manassis, 2011). It remains essential to continue research on comorbid subthreshold symptoms and their relation to later impairment because the implications are crucial to the conceptualization, treatment, and prevention of anxiety and depression based on subclinical patterns of depressive and anxiety symptoms.

Factor Structure of Depression and Anxiety Symptoms

Cultural meanings associated with mental health symptoms can have implications for how individuals cope with symptoms, whether individuals are motivated to seek treatment, and how supportive families and communities are (U.S. Department of Health and Human Services, 2001). Since African American youth living in low-income communities with internalizing symptoms are disproportionately under-identified and underserved, they may be more likely to suffer the negative outcomes associated with untreated mental illness (Achenbach, Rescorla, & Ivanova, 2005; Safren, Gershuny, Marzol, Otto, & Pollack, 2002). The development and use of

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well-validated measures of depression and anxiety for African American youth living in high-burden communities is an important step towards understanding the intersection of race and economic disadvantage in the development of internalizing symptoms (Brown et al., 2013). As such, the validation of culturally sensitive measures should include factor structure validation for currently used measures of both anxiety and depression with minority youth. Even to date, few studies have validated or confirmed the factor structure of measures of depressive and anxiety symptoms in African American adolescent samples.

Two measures for adolescent depressive and anxiety symptoms include the Children's Depression Inventory (CDI) and the Revised Children's Manifest Anxiety Scale (RCMAS). For the CDI, previous factor analyses of this measure among African American youth did find some support for the original five factors identified by Kovacs (i.e., negative mood, interpersonal difficulties, negative self-esteem, ineffectiveness, and anhedonia). Steele and colleagues (2006) tested the factor structure of the CDI in a predominantly low-income community sample of African American youth and were able to replicate the factor structure in their sample. However, they had to correlate several item residuals, which may be indicative of unexplained shared covariance among items possibly due to the presence of an underlying latent construct. They suggested that contextual influences, such as minority status or SES, may affect the manifestation of depressive symptoms but were unable to explicitly test for these effects and highlighted the need for additional research in this area. A more recent study of low-income African American youth by Taylor and colleagues (2014) found that a six-factor structure originally proposed by Craighead and colleagues (1998) best fit the data. The six factors included a) dysphoria, b) social problems, c) externalizing problems, d) self-deprecation, e) school problems, and f) biological dysregulation. Taylor and colleagues (2014) highlighted

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consistencies between prior theoretical and empirical work that has indicated the relevance of externalizing behaviors in the presentation of psychological distress and offered stressful life experiences (e.g., poverty, exposure to community violence) and societal influences (e.g., racism, discrimination) as potential contributing factors (Attar, Guerra, & Tolan, 1994; Cassidy & Stevenson, 2005; Lambert, Ialongo, Boyd, & Cooley, 2005).

For the RCMAS, the original structure was comprised of three factors including physiological anxiety, worry/oversensitivity, and concentration/social concerns (Reynolds & Richmond, 1978). In a study by White and Farrell (2001), the authors proposed a four-factor expert-derived model (i.e., dysphoric mood/low self-concept, social evaluation/oversensitivity, worry, and anxious arousal) and compared it to a three-factor model excluding dysphoric mood/low self-concept, and the original three factor model developed by Reynolds and Richmond (1978) in a sample of predominantly African American youth. The findings for this study identified the expert-derived four-factor model as the most parsimonious and best-fitting model. The four factors emphasize cognitive and physiological aspects of anxiety as well as internal processing of the environment which are consistent with cognitive-behavioral therapy conceptualizations. Another study by Boyes and Culver (2013) conducted confirmatory factor analyses (CFA) of the RCMAS among a sample of children and adolescents living in Cape Town, South Africa. They found support for an alternative four-factor model consisting of social evaluation, worry, affective response, and physiological symptoms/sleep problems factors that are similar to the expert-derived model reported by White and Farrell (2001).

Person-centered Analyses for Depression and Anxiety

Studies that use variable-centered analyses often treat depressive and anxiety symptoms as categorical and use constructs associated with diagnostic criteria outlined by the DSM-5.

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However, when studying complex symptoms that are known to be highly comorbid, the use of categorical diagnostic constructs can result in the loss of information valuable to the understanding of the comorbidity between depression and anxiety symptoms (van Lang, Ferdinand, Ormel, & Verhulst, 2006). For instance, when determining comorbidity, individuals who report subthreshold or subclinical levels of anxiety or depressive symptoms, based on the need to meet the criteria outlined by the DSM-5, would not be considered a comorbid case. Methods such as latent class analysis (LCA) and latent profile analysis (LPA) can provide crucial information about the interplay between these dynamic and related symptoms. Latent profile analysis allows researchers to identify patterns or profiles of similar data among individuals rather than among variables and can be derived from a heterogeneous population. Some studies, outlined below, have identified symptom patterns of anxiety and depressive symptoms among children and/or adolescents.

To date, only three known studies have conducted person-centered analyses, such as LCA, for anxiety and depressive symptoms in samples comprised solely of children and/or adolescents. No known studies have examined depressive and anxiety symptoms using person-centered analyses in predominantly African American samples. A study by Wadsworth and colleagues (2001) covered the widest age range, including youth ages 4 to 18. This study combined a sample of 1,987 children and adolescents referred for mental health services (83% white, 14% African American, 3% mixed or other) with another sample of 1,987 youth who were not referred for services (74% white, 16% African American, 10% mixed or other). Anxiety and depressive symptoms were reported by parents or guardians and assessed using the Child Behavior Checklist (CBCL–Parent Report; Achenbach, 1991).

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Analyses were run using separate models grouped by age (i.e., ages 4-11 and ages 12-18) and gender (i.e., boys and girls). Results identified a three-class solution as the best fit for boys and girls of both age groups in the referred and non-referred samples; however, the composition of these classes differed based on whether the sample was referred or non-referred. For girls and boys, class membership in the non-referred sample fit into low (i.e., a class with low severity or no anxiety or depressive symptoms), mild (i.e., a class with only a few, mild severity anxiety and depressive symptoms), or moderate (i.e., a class with moderate severity anxiety and depressive symptoms) classes. The percentages of girls in the non-referred sample represented in each class for ages 4-11 and 12-18, respectively, were 51% and 55% in the low class, 39% and 34% in the mild class, and 9% and 10% in the moderate class. The percentages of boys in the non-referred sample represented in each class for ages 4-11 and 12-18, respectively, were 46% for both age ranges in the low class, 46% and 42% in the mild class, and 8% and 11% in the moderate class. Girls endorsed significantly more severe anxiety and depressive symptoms than boys in the non-referred sample.

For the referred sample, a three-class solution emerged that included classes representing mild (i.e., a class with only a few, mild severity anxiety and depressive symptoms), moderate (i.e., a class with moderate severity anxiety and depressive symptoms), and severe (i.e., a class with high severity anxiety and depressive symptoms) anxiety and depressive symptoms. However, in contrast to the non-referred groups, the low anxiety or depressive symptom class was not found. Class membership for girls in the referred sample fit into mild (25% and 22%), moderate (43% and 31%), and severe (31% and 41%) groups for ages 4-11 and 12-18 respectively. Class membership for boys in the referred sample fit into mild (35% and 43%), moderate (43% and 48%), and severe (21% and 8%) groups for ages 4-11 and 12-18

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respectively. Referred adolescent boys reported significantly more severe anxiety and depressive symptoms in both the moderate and severe classes than girls and younger referred boys.

Another study focused on 2,032 early, mid-, and late adolescents, ages 11-18 (mean age = 13.5; 43.8% girls) who were referred to outpatient psychiatry in the Netherlands (Ferdinand, de Nijs, van Lier, & Verhulst, 2005). Youth reported their symptoms using the Youth Self Report measure (YSR; Achenbach, 1991), and an LCA supported a six-class solution with five percent or more of the sample present in each class. This included two classes comprised of youth who reported high rates of anxiety symptoms, but in one class, comprising 15% of the sample, youth also reported high rates of depressive symptoms whereas in the other, comprising 5% of the sample, youth endorsed moderate levels of depressive symptoms. Three classes were represented by adolescents with moderate anxiety symptoms, and these were: (a) a comorbid moderate depressive symptom class (27%), (b) a comorbid low depressive symptom class (6%), and (c) a class representing adolescents who endorsed moderate levels of most depressive symptoms but high levels of sleep problems (7%). The final class comprised 36% of the sample and included comorbid low-level anxiety and depressive symptoms.

Another study examined anxiety and depressive symptoms in a sample of 2,230 Dutch early adolescents (mean age = 11.09, 50.8% girls) (van Lang, Ferdinand, Ormel, & Verhulst, 2006). Youth reported their symptoms using the YSR (Achenbach, 1991), and an LCA showed that a five-class model best fit the data. Only one percent of early adolescents had mainly depressive or anxiety symptoms, and most (99%) had comorbid symptoms. Two “high-symptom” classes were identified, one represented by adolescents with high rates of anxiety symptoms and comorbid symptoms of mild depression (15%), and another class was comprised of youth with high rates of anxiety symptoms and comorbid symptoms of severe depression

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(6%). Two additional classes were characterized by adolescents with moderate anxiety symptoms and moderate depressive symptoms (23%), and one class was differentiated in that youth also reported high levels of depressive symptoms related to problems with eating and sleeping (17%). The final group comprised 39% of the sample and was characterized by low levels of both depressive and anxiety symptoms.

Several comparisons can be made across these three studies that examined depressive and anxiety symptoms in youth together using LCA. Two of the studies used items from the YSR (Ferdinand et al., 2005; van Lang et al., 2006) while Wadsworth and colleagues used the accompanying parent-report of the measure, the CBCL (Achenbach, 1991). Across studies, all classes included a combination of anxiety and depressive symptoms. All studies identified one group, that comprised the largest percentage of the sample, which reflected low rates of both anxiety and depressive symptoms and another group, that comprised a smaller percentage of the sample, which included high rates of both anxiety and depressive symptoms. Results of the two studies that focused solely on adolescents showed some additional differentiation in anxiety and depressive symptoms. Both studies identified a class of adolescents with moderate levels of both anxiety and depressive symptoms and endorsed heightened levels of sleep problems (e.g., sleeps less, trouble sleeping) (Ferdinand et al., 2005; van Lang et al., 2006). A key difference between the two study findings is that Ferdinand and colleagues (2005) found support for a class of individuals with moderate-severity anxiety symptoms but without moderate-severity depressive symptoms while van Lang and colleagues (2006) did not. This finding suggests that depressive symptoms do not occur separate from anxiety symptoms and this was also supported by the third study that focused on both children and adolescents (Wadsworth et al., 2001).

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To date, only one study has used a person-centered approach to identify patterns of anxiety and depressive symptoms among an early adolescent sample (i.e., ages 10 to 12; van Lang et al., 2006). A better understanding of patterns of depressive and anxiety symptoms during early adolescence can help illustrate the presence of sub-groups of adolescents who experience similar patterns of symptoms during this developmental stage. For African American youth, understanding these patterns may be especially helpful in the identification of internalizing problems based on racial/ethnic specific symptom presentation. Because the comorbidity rate of depressive and anxiety symptoms increases during adolescence, a dynamic person-centered approach to assess whether specific symptom profiles or classes emerge during this developmental period for African American youth is crucial for conducting effective assessment and treatment. The current study adds to the literature in this area by examining profiles of depressive and anxiety symptoms in African American early adolescents living in urban, low-income neighborhoods in the Southeastern United States.

Correlates of Profiles of Anxiety and Depressive Symptoms

Within the small number of studies that have identified patterns of depressive and anxiety symptoms using LCA, even fewer have assessed correlates that are associated with the resulting profiles. Three studies included gender as either a covariate or correlate to assess for similarities and differences in the representation of females and males across profiles. In one study of adolescents, females were more likely than males to be represented in a class that comprised high rates of both anxiety and depressive symptoms (Ferdinand et al., 2005). These authors also included age as a correlate and found that older adolescents were more likely to be represented in classes with higher reported severities of anxiety and depressive symptoms as compared to younger adolescents. Overall, no correlates have been examined in this area of the childhood and

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adolescent literature on patterns of anxiety and depressive symptoms aside from demographic characteristics. The current study seeks to advance the literature in this area by examining associations between identified patterns of anxiety and depressive symptoms and characteristics of the school environment (i.e., the quality of student-student and student-teacher relationships) and individual factors (i.e., emotion regulation).

The Role of School Interpersonal Relationships

From a social development perspective, school interpersonal relationships (i.e., student-teacher relationships, student-student relationships) represent a key factor that can play a role in promoting positive perceptions and preventing internalizing symptoms. The social development model of child development suggests that quality interactions between peers and with their teachers in the school environment can influence important developmental outcomes (Roeser et al., 2000). Teachers are the most salient and present non-parental adults in the lives of adolescents, and research has shown that the quality of student-teacher relationships is related not only to adolescents' academic achievement (Hosan & Hoglund, 2017) but also to the frequency of internalizing (Eccles et al., 1993; Roeser et al., 2000) and externalizing symptoms (Behrhorst, Sullivan, & Sutherland, 2019). When experiences within the school environment help meet the developmental needs (e.g., interpersonal support) of adolescents, they can experience positive influences on academic adjustment as well as social and emotional well-being (Roeser et al., 2000).

Phenomenological variant ecological systems theory (PVEST) model takes into consideration diverse individual-contextual interactions at varying levels of development (Spencer et al., 1997). It provides a mechanism for addressing conditions of inequality of social opportunities and exploring protective factors that contribute to resiliency and may offset

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significant levels of risk (Spencer et al., 1997). Aligned with the risk and resilience framework, PVEST suggests similar interactions between adolescents and their peers and with their teachers in the school environment (Zimmerman & Arunkumar, 1994; Zimmerman et al., 2013). Risk and resilience theory acknowledges the transactional nature between these dynamic interactions that may influence each other over time. Particularly for African American youth, risk factors such as prejudice, racial discrimination, and living in under-resourced neighborhoods can increase the risk of internalizing symptoms by impacting youth's perceived control and perceptions of threat (Draguns & Tanaka-Matsumi, 2003; Kirmayer, 2001; Mineka & Zinbarg, 2006). Environment and social conditions may predispose African American youth to more internalizing symptoms based on the social and economic disadvantage of living in under-resourced areas and exposure to more stressful life events (Ramos, Jaccard, & Guilamo-Ramos, 2003). Whether or not personal (e.g., parental mental health, family violence, neglect) or environmental (e.g., community violence, criminal and gang activity, drug use, poverty; USDHHS 2001; Fitzpatrick et al. 2005) risk factors are present that predispose individuals to negative developmental outcomes (e.g., depressive and anxiety symptoms), protective factors (e.g., positive student-teacher and student-student relationships) can increase youth resilience and decrease the likelihood of negative outcomes (e.g., substance use, self-harm; Lee, Cheung, & Kwong, 2014). School interpersonal relationships can influence the presence of internalizing symptoms and work as a protective factor which can modify or even replace current models of unhealthy attachment (Reddy, Rhodes, & Mulhall, 2003). Despite well-established general literature on the role that racial and ethnic differences play in how support givers influence the development of positive and negative outcomes (i.e., the differential importance placed on interpersonal relationships as protective factors due to the role of cultural heritage/collectivist culture; Plant,

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Sachs-Ericsson, & Sobell, 2004; Ennis et al., 2000; Holahan & Moos, 1987), little research specifically examines associations between school interpersonal relationships and internalizing symptoms for African American youth.

Student-teacher relationships. Teachers can provide a foundation of caring and trusting relationships within a novel environment where students can then build autonomy, self-esteem, self-expression, and decision-making skills. If adolescents experience an environment where there is a mismatch between their developmental needs and the context they are in, they may suffer academically and psychologically (i.e., they will be at a greater risk for developing internalizing symptoms; Eccles et al., 1993; Roeser et al., 2000). For African American youth, lack of teacher support or perceptions of negative relationships with teachers associated with perceived unfair treatment, discrimination, or feeling disconnected from school can contribute to academic issues (Gregory & Winston, 2008). However, for both minority and majority youth, teachers may act as positive attachment figures at school by providing close affective relationships that increase positive developmental outcomes (Lee Cheung, & Kwong, 2011; Sabol & Pianta, 2012).

Student-student relationships. Additionally, youth are shifting to peer-centered relationships and increasingly derive emotional and instrumental support from peers (Prinstein, Boergers, & Vernberg, 2001). Social cognitive growth (e.g., in empathy and perspective-taking) allows adolescents to view and understand their relationships with peers and teachers in more sophisticated and nuanced ways (Maccoby, 1998). Yet, African American youth may experience increased peer relationship problems (e.g., bullying and teasing; Kann et al., 2016) and have reported higher prevalence of safety concerns (6.8%) associated with peers (12.6% report getting in a physical fight on school property) compared to white students (4.2%). Understanding the

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associations between ecological factors (e.g., school interpersonal relationships) and patterns of depression and anxiety for African American youth during early adolescence may help to illustrate a more complete picture of the nature of these relations (Zimmerman et al., 2013).

Associations between school interpersonal relationships and depression. Strong empirical evidence exists for student-teacher relationships as a key promotive factor for decreasing depressive symptoms among adolescents. Overall, the quality of student-teacher relationships and/or teacher support were explored most often as a direct predictor of rates of depression or depressive symptoms with a few studies examining potential bidirectional relations (Pössel et al., 2013; Reddy et al., 2003; Way, Reddy, & Rhodes, 2007) between these variables. The studies that did explore directionality supported a promotive unidirectional relation between positive student-teacher relationships and rates of depressive symptoms such that higher quality student-teacher relationships and support predicted lower rates of depressive symptoms and not the reverse (Pössel et al., 2013; Reddy et al., 2003; Way et al., 2007). Student-teacher relationships were associated with lower rates of depressive symptoms cross-sectionally and longitudinally across diverse samples of youth in early and middle adolescence.

Huang, Lewis, Cohen, Prewett, and Herman (2018; $N = 691$ students grades 6-8; 50% female; 67% Black, 17% white, 16% other race/ethnicity) found that higher quality student-teacher relationships were associated with lower rates of depression. Fixed effects were included to account for the clustering of respondents within schools, and a significant small effect was found (Cohen's $d = -.12$) between higher quality student-teacher relationships and lower rates of depression. Two studies by Reddy et al. (2003; $N = 2,585$ American students; grades 6-8; 63% female; 82.2% white, 6.2% Hispanic, 3.2% Asian American, 6.3% African American, 1.8% multiracial) and Way et al. (2007; $N = 1,451$ American students grades 6-8; 54.2% female; 91%

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white) examined relations between student-teacher relationships and depressive symptoms. In both studies, findings showed that students who perceived higher levels of positive student-teacher relationships reported sharper declines in depressive symptoms as compared to students who reported lower levels of positive student-teacher relationships. Reddy et al. (2003) found the initial quality of student-teacher relationships was negatively related to the initial level of depression, and the slope reflecting changes in student-teacher relationships over time was negatively related to the slope for the level of depression. Way et al. (2007) found that a decline in perceptions of positive student-teacher relationships over time was associated with increased depressive symptoms.

Similar findings emerged for studies examining the promotive effect of student-student relationships on depressive symptoms. Colarossi and Eccles (2003) examined a sample of 217 adolescents ages 15 to 18 (mean age = 17; 58% female; 92% white, 3% Asian American, 5% African American, Arabic, or American Indian) and found that friend support predicted decreased depressive symptoms. A longitudinal study by DeWit et al. (2011) found that declines in classmate support predicted increased depressive symptoms among 2,616 adolescents (mean age = 13.77; 54% female). Way et al. (2007) looked specifically at changes across middle school (1,451 students grades 6-8; 54.3% female; 91% white) and found that declines in student reported peer support led to corresponding increases in depressive symptoms, and the effect size of peer support on depression was medium to large.

Associations between school interpersonal relationships and anxiety. Research supporting the promotive effect of high-quality student-teacher relationships on anxiety symptoms has been shown primarily in studies of elementary school children with relatively little research found using adolescent samples (Kurdi & Archambault, 2018; Zee & Roorda,

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2018). Zee and Roorda (2018) examined relations between the quality of student-teacher relationships and rates of anxiety symptoms in a sample of 269 third through sixth grade students (50.9% female; 74.7% native Dutch). Youth who reported student-teacher relationships characterized by higher versus lower levels of conflict and dependency displayed higher rates of anxious behavior in the classroom. Similar findings were seen in a sample of Canadian elementary school students (i.e., third and fourth grade; 48% female) showing that conflict within student-teacher relationships was associated with higher rates of anxiety. Neither study found significant links between teacher warmth or teacher closeness and rates of anxiety symptoms in children or early adolescents. However, in a study of Chinese adolescents in seventh and eighth grade (mean age = 14.34; 57.4% female), teacher autonomy support was related to higher levels of basic psychological needs satisfaction, and led to decreased levels of anxiety (Yu, Li, Wang, & Zhang, 2016).

When considering the literature on adolescents, the primary focus has been on the influence of supportive student relationships on social anxiety (Coyle & Malecki, 2018; Hendron & Kearney, 2016). Studies that have examined these associations have found that high frequencies of peer support are negatively associated with social anxiety (Coyle & Malecki, 2018; Hendron & Kearney, 2016). In contrast, one study found that the degree to which individuals value peer support was positively associated with social anxiety a sample of 398 high school students (grades 9-12; 45% female; 91.7% white) (Coyle & Malecki, 2018). Meaning, students who placed a high value on receiving socially supportive behaviors from their peers were at greater risk for social anxiety than those who reported low or average values (Coyle & Malecki, 2018). Another study by Coyle, Malecki, and Emmons (2019) focused on 669 students in grades six through eight (50% female; 53% white, 10% Black, 9% Hispanic, 15% Asian, 1.2%

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American Indian, 0.1% Pacific Islander, and 12.1% Multiracial). The findings showed that negative peer experiences (e.g., bullying, victimization) were positively associated with social anxiety whereas positive peer social support was inversely related to social anxiety symptoms.

Taken together, these findings provide important information about the role of social support, both from teachers and peers within the school context, on anxiety and depression levels and the importance of these relationships for the social and emotional functioning of adolescents. This examination of the promotive influence of social relationships, aside from parental or caregiver relationships, on rates of depression and anxiety is crucial for a more comprehensive understanding of social influences on development during adolescence.

The Role of Emotion Regulation

Emotion regulation refers to the ability to modify one's emotion experiences and expressions in a manner that is adaptive in response to environmental and interpersonal demands (Campos, Mumme, Kermoian, & Campos, 1994; Thompson & Calkins, 1996). Specific constructs of emotion regulation (e.g., emotion awareness, emotion expression) are implicated in the differentiation of anxious and depressive symptoms in children and adolescents in both a broad and specific sense (Sendzik, Schafer, Samson, Naumann, & Tuschen-Caffier, 2017). Emotion awareness is directly applicable to emotion regulation in that it is a critical skill and basic building block of emotion competence (Halberstadt, Denham, & Dunsmore, 2001). Individuals struggling with accurate awareness of their emotions will likely not be effective when determining coping skills that can adaptively modify emotion expression. Feeling comfortable expressing emotions is another building block of emotion regulation defined by the degree of an individual's willingness or reluctance to express emotions, and at the extremes reflects difficulties with emotion regulation (Kerns, Comer, & Zeman, 2014). Reluctance to

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express negative emotions can have an adverse effect on social competence (Denham, 2007) and reduce opportunities for adolescents to engage in social interactions to help develop emotion regulation skills they need to build positive social relationships (Penza-Clyve & Zeman, 2002; Perry-Parrish, Waasdorp & Bradshaw, 2012). Adaptive emotion regulation is an internal asset that reflects individual attributes related to healthy development (Zimmerman, 2013).

African American youth may be more sensitive to the context of emotion regulation and expression stemming from parental socialization processes in African American families (Dunbar, Leerkes, Coard, Supple, & Calkins, 2017). African American families may validate and suppress the emotional experiences and expression of their children as a way to prepare youth for bias by members of a different racial group (Dunbar et al. 2017). As such, social expression for African American youth may vary greatly depending on the contexts in which they are more exposed. Emotion expression in African American youth is often mis-identified or mis-attributed as anger when compared to emotion expression in white youth (Thomas, Coard, Stevenson, Bentley, & Zamel, 2009; Barbarin et al., 2013; Halberstadt, Castro, Chu, Lozada, & Sims, 2018). Within the school context, African American youth engage in multiple emotion expression strategies (e.g., suppression, management, expression) and students who report higher levels of suppression of anger have been perceived more favorably by African American teachers (Thomas, Coard, Stevenson, Bentley, & Zamel, 2009).

A recent meta-analysis of 21 studies examined relations between depressive and anxiety symptoms and emotional awareness (Sendzik, Schafer, Samson, Naumann, & Tuschen-Caffier, 2017). Results showed a medium effect size for relations between difficulties with emotional awareness and higher rates of either depressive or anxiety symptoms separately or in combination. The majority of studies to date are cross-sectional, and therefore, preclude

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conclusions about the directionality and causality of these relations. The presence of depressive and anxiety symptoms may lead to impaired awareness of emotions and challenges in adaptive emotional expression (Penza-Clyve and Zeman 2002); however, difficulties in emotional awareness and low emotion expression may also result in increased depressive and anxiety symptoms over time (Kranzler et al., 2016). In the current study, associations between poor emotional awareness, reluctance to express emotions, and specific patterns of depressive and anxiety symptoms will be examined.

Associations between emotion regulation and depression. Adolescents with depression have been found to have difficulty understanding their emotions, experience poor emotional awareness, and show increased levels of reluctance to express emotions (Kranzler et al., 2016). For African American youth, emotion regulation has also been identified as a factor that differentiates resilient from non-resilient youth and can protect youth exposed to community violence (Kleiwer et al., 2004) and decrease the risk of depression (Silk et al., 2006). The current research on relations between emotion regulation and depressive symptoms in adolescence has primarily focused on associations between emotion awareness and depression. In one study of adolescent girls, participants diagnosed with major depressive disorder reported higher levels of poor emotion awareness as compared to participants without a psychiatric diagnosis (Sim & Zeman, 2004). In a sample of 22 Dutch youth (mean age = 11.87; 65% female), Van Beveren and colleagues (2019) found an indirect effect on relations between emotional awareness and depressive symptoms via adaptive emotion regulation strategies (e.g., reappraisal and positive refocusing). However, no direct effect between rates of emotional awareness and depressive symptoms was found. In a study of 230 Dutch youth (mean age = 13.40; 48% female), higher rates of depressive symptoms were both a cause and consequence of low emotional clarity (Blöte

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& Westenberg, 2019). Thus, findings from this study supported a reciprocal relationship between depressive symptoms and emotional clarity over time. Findings also indicated the cyclical nature of early symptoms of depression in predicting decreased emotion regulation (e.g., emotional clarity) which then lead to increased depressive symptoms in the future.

Relatively fewer studies have examined associations between emotion expression or reluctance to express emotions in adolescence. Keenan, Hipwell, Hinze, and Babinski (2009) found that inhibited, or reluctant, expression of negative emotions was associated with increased depressive symptoms in a sample of 232 girls. In a study of adolescents ages 12 to 18 (97 adolescents diagnosed with major depressive disorder, 101 adolescents in control group), a low level of emotion expression was related to more severe depressive symptoms, and adolescents diagnosed with major depressive disorder had significant impairment in emotion expression (Özyurt, Öztürk, Onat, Mutlu & Akay, 2018).

Associations between emotion regulation and anxiety. Similarly, adolescents who experience high levels of anxiety tend to have lower rates of emotional awareness, more difficulties with emotional expression and managing negative emotions, and less confidence in their ability to manage emotions in general compared to peers with lower levels of anxiety (Kranzler et al., 2016; Southam-Gerow & Kendall, 2000; Spokas, Luterek, & Heimberg, 2009; Suveg & Zeman, 2004). Literature examining associations between emotion processes and anxiety among children and adolescence is more evenly weighted between emotion awareness and emotion expression (e.g., expressive reluctance). Several studies have examined emotion awareness in elementary school-age children and found that the inability to identify one's emotions predicts increased internalizing symptoms, and poor emotion awareness is significantly associated with higher rates of self-reported depressive ($r = 0.48$) and anxiety symptoms ($r =$

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0.61) (Zeman, Shipman, & Suveg, 2002; Penza-Clyve & Zeman, 2002). Schneider, Arch, Landy, and Hankin (2018) conducted a longitudinal study of 312 youth ages 8-16 (mean age = 11.68 at Time 1; 59% female) and found that poor emotion awareness was associated with higher rates of social and physical anxiety symptoms, and predicted increased symptoms of social anxiety over time. Similarly, Rieffe and de Rooij (2012) found that emotional awareness predicted increased symptoms of fear and worry among 663 children and adolescents (mean age = 10 at Time 1; 44% female). In a meta-analytic review of relations between domains of emotional competence and anxiety symptoms in children and adolescents (185 studies; *N*'s range from 573 to 25,711), results showed that youth with higher versus lower rates of anxiety were less aware of their emotions ($r = -0.28$), less effective at expressing their emotions ($r = -0.15$), less able to understand their emotions ($r = -0.20$), and reported less emotional self-efficacy ($r = -0.36$) (Mathews, Koehn, Abtahi, & Kerns, 2016).

Children who are reluctant to express their feelings report increases in recurrent negative thoughts over time (Rieffe & de Rooij, 2012). The above-mentioned meta-analysis identified eleven studies of children and adolescents with main findings supporting a small but significant overall effect ($r = -0.15$) of emotion expression difficulties on higher rates of anxiety (Matthews et al., 2016). Youth with high levels of anxiety are less effective or willing to express emotions physically or verbally (Matthews et al., 2016). Further, the authors found that sixth through eighth graders ($N = 1,065$; 49% female) with higher rates of social anxiety reported greater difficulty in expressing emotions (Klemanski, Curtiss, McLaughlin, & Nolen-Hoeksema, 2017). They also noted a significant association between comorbid social anxiety and depression and higher rates of poor emotional awareness and expressive reluctance.

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Given that both depression and anxiety are associated with difficulties in emotion regulation processes, it is important to explore associations between specific processes including poor emotional awareness and expressive reluctance and profiles of depressive and anxiety symptoms. Exploration of these associations will help to understand how combinations of subthreshold anxiety and depressive symptoms may be similarly or differentially related to emotion regulation processes which will inform theoretical conceptualization and treatment of symptomatology in African American youth.

Current Study

Depressive and anxiety symptoms can significantly and negatively impact positive adolescent development. The current study added to the literature in this area by using LPAs: (a) to identify patterns of anxiety and depressive symptoms in African American early adolescents living in high-burden communities, and (b) to examine relations between these patterns and individual (i.e., emotion regulation) and interpersonal (i.e., the quality of student-student and student-teacher relationships) factors. Prior research using LCAs or LPAs to identify patterns of anxiety and depressive symptoms among adolescents have focused on samples of predominantly European or European American adolescents (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001). Further, these studies used CBCL parent- and self-report measures (Achenbach, 19991) that comprised limited items assessing anxiety and depressive symptoms, and thus restricted the dimensions of depression and anxiety that could be examined. In contrast, the current study included measures that assessed a wider range of anxiety and depressive symptoms (i.e., the CDI and RCMAS). Further, the assessment of correlates related to patterns of anxiety and depressive symptoms in prior studies was limited to demographic characteristics of age and gender (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001). The

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current study expanded knowledge of factors (i.e., emotion regulation and school interpersonal relationships) that may be associated with patterns of anxiety and depressive symptoms among African American early adolescents.

Aims and Hypotheses

Aim One. The first aim of the study was to assess the factor structure of the CDI and RCMAS for the current study sample using CFA. Both the original factor structures identified for the CDI and RCMAS and factor structures supported in samples of African American/Black youth (e.g., Boyes & Culver, 2013; Kovacs, 1992; Steele et al., 2006; Taylor et al., 2014; Reynolds & Richmond, 1978; White & Farrell, 2001) were tested.

Hypothesis a. Based on the two studies that have analyzed the factor structure of the CDI using samples of low-income African American youth, it is anticipated that the five (Steele et al., 2006) or six-factor (Taylor et al., 2014) model of depressive symptoms will provide the best fit for the current study sample.

Hypothesis b. Based on prior studies that have analyzed factor structure of the RCMAS among African American/Black adolescents, it is anticipated that the expert-derived four factor model (White & Farrell, 2001) or the four-factor model identified by Boyes and Culver (2013) will provide the best fit for the current study sample.

Aim Two. The second aim of this study was to identify patterns of depressive and anxiety symptoms using LPA. Prior studies using LCA in adolescent samples to identify patterns of depressive and anxiety symptoms were conducted at the item-level. For the current study, an LPA was conducted using the dimensions of depressive (i.e., dysphoria, social problems, externalizing problems, self-deprecation, school problems, and biological dysregulation) and anxiety (i.e., social evaluation, worry, affective response, and physiological symptoms/sleep

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problems) symptoms. These are dimensions identified by CFAs on the CDI and RCMAS in prior studies of predominantly African American adolescents and were also supported by CFAs conducted for the current study.

Hypothesis c. Based on the limited literature using person-centered analyses to identify patterns of depressive and anxiety symptoms in adolescents, it is hypothesized that the LPA will identify at least three distinct profiles. Consistent with prior LCAs of anxiety and depressive symptoms among adolescents (Ferdinand et al., 2005; van Lang et al., 2006), it is anticipated that high-severity, moderate-severity, and low-severity profiles will be identified, each comprising both anxiety and depressive symptoms. In addition, it is hypothesized that within the moderate and high-severity profiles, dimensions of externalizing symptoms, physiological symptoms, and sleep problems will be higher compared to other dimensions of depression and anxiety based on the presentation of symptoms in African American/Black youth found in prior studies (e.g., Boyes & Culver, 2013; Steele et al., 2006; Taylor et al., 2014; White & Farrell, 2001).

Aim Three. The third aim of this study was to examine relations between the emerging patterns of anxiety and depressive symptoms and: a) school interpersonal relationships (i.e., the quality of student-teacher relationships and student-student relationships) and b) emotion regulation.

Hypothesis d. It was anticipated that adolescents who report higher versus lower quality of student-student relationships and student-teacher relationships will be more likely to be members of profiles with lower rates of anxiety and/or depressive symptoms and less likely to be members of profiles with higher rates of anxiety and/or depressive symptoms.

Hypothesis e. It was anticipated that adolescents who report lower versus higher emotion regulation difficulties will be more likely to be members of profiles with lower rates of anxiety

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and/or depressive symptoms and less likely to be members of profiles with higher rates of anxiety and/or depressive symptoms.

Method

Participants

Data were collected from 265 sixth, seventh, and eighth grade students who attended an urban, public middle school in the Southeastern United States at two time points spanning approximately six months (October 2010-March 2011). Participating students were involved in a larger study evaluating the effectiveness of a violence prevention program, Second Step: Student Success Through Prevention Program (Committee for Children, 2008). For the intervention, 12 classes (4 per grade) were randomly assigned to the intervention or control conditions ($n = 354$), representing a little over half of the students enrolled at the school ($n = 604$). Of the 354 students who were eligible to participate in the study, 272 (77%) enrolled and 265 (97%) completed data collection. Most participants identified themselves as African American (77%), 11% were Multiracial, 4% Hispanic, and 2% white. A large proportion of students attending this school (88%) during the 2010-2011 school year were eligible for a federally subsidized school lunch program, and many students lived in high-burden neighborhoods as represented by elevated rates of poverty and crime. For the current study, only participants who identified as African American ($n = 196$) were included in data analyses. Participants ranged in age from 10 to 15 years old ($M_{\text{age}} = 12.6$, $SD = 1.0$) and half were female.

Procedure

All study procedures were approved by the VCU institutional review board. Prior to data collection, written parental permission and student assent was obtained from all participants. Students received a \$10 gift card for completing a computer-based survey at school. They were

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able to both read and listen to the survey questions, and research staff were available to answer any questions.

Measures

Depression. The 26-item Children's Depression Inventory (CDI; Kovacs, 1992) was used to assess behavioral and cognitive symptoms of depression. A comparison of factor structures using CFAs supported a six-factor model that included dimensions of: a) dysphoria, b) social problems, c) externalizing, d) self-deprecation, e) school problems, and f) biological dysregulation for the current sample (see CFA section). Participants were prompted "In the last 2 weeks, which best describes you..." and asked to respond on a 3-point scale how characteristic each item has been of them in the past 2 weeks (e.g., 0 = *I am sad once in a while*, 1 = *I am sad many times*, 2 = *I am sad all the time*). For the total scale, $\alpha = .82$.

Anxiety. The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978) was used to assess anxiety symptoms. A comparison of factor structures using CFAs supported a four-factor model for use with the current sample that included dimensions of a) social evaluation (e.g., "*I feel like others do not like the way I do things*"), b) worry (e.g., "*I often worry about something bad happening to me*"), c) affective response (e.g., "*My feelings get hurt easily*") and d) physiological symptoms/sleep problems (e.g., "*Often I feel sick to my stomach*"; see CFA section). Items were reported using dichotomous response choices (1 = *no* and 2 = *yes*). For the total scale, $\alpha = .90$.

School interpersonal relationships. Items to assess school interpersonal relationships were adapted from the Vessels' School Climate Survey (Vessels, 1998) and recoded such that higher scores reflected students' perceptions of more positive relationships. A CFA indicated that a three-factor model including the subscales of student-student relationships, student-teacher

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relationships, and awareness and reporting of violence fit the data adequately, $\chi^2(76) = 378.21$, $p = .00$, (CFI = .94; RMSEA = .07). However, based on the high correlations between Factors 2 and 3 ($r = .96$), a two-factor model combining the student-teacher relationships and awareness and reporting of violence subscale was tested. The two-factor model fit the data adequately, $\chi^2(73) = 381.33$, $p = .00$, (CFI = .94; RMSEA = .07) with no significant difference in model fit when compared to the three-factor model, using the chi-square difference test, $\Delta\chi^2(3) = 4.88$, $p = .18$. Therefore, the two-factor model was used for the current study (i.e., Factor 1 - student-student relationships and Factor 2 - student-teacher relationships).

The student-student relationships subscale included seven items that assessed participants' self-reported perceptions of the quality of relationships between students at their school (e.g., *"Students are kind and supportive of one another," "Students stop other students who are unfair or disruptive,"* and *"Students get along well most of the time"*; $\alpha = .88$). The student-teacher relationships subscale included 11 items that assessed participants self-reported perceptions of the quality of relationships between students and teachers at their school (e.g., *"Teachers treat students with respect"* and *"Teachers take time to help students work out their differences"*) and perceptions of awareness and/or responsiveness to violence at their school (e.g., *"Teachers know when students are being picked on or being bullied"* and *"Students report it when one student hits another"*; $\alpha = .92$). Items were rated on the following 4-point scale: 1 = *Strongly agree*, 2 = *Agree*, 3 = *Disagree*, 4 = *Strongly disagree*.

Emotion regulation. The 15-item Children's Anger Management Scale (CAMS; Penza-Clyve & Zeman, 2002) was used to assess emotion regulation coping, inhibition, and dysregulated expression. To more fully assess each construct, four items were added to the original 11-item scale (i.e., *"I don't like for other people to see how angry I am," "Even when*

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I'm mad, I can think through ways to cope with my anger," "When I get angry, I take it out on other people," "When I get angry, I explore"). A CFA indicated that the three-factor model comprising the subscales of anger emotion regulation, anger inhibition, and anger dysregulated expression fit the data adequately, $\chi^2(87) = 179.87$, $p = .00$, (CFI = .94; RMSEA = .08). The Anger Emotion Regulation Coping subscale included five items assessing strategies for coping with anger (e.g., *"I stay calm and keep my cool when I am feeling mad"*; $\alpha = .80$). Poor emotion awareness was represented by the Anger Inhibition and the Anger Dysregulated Expression subscales. The Anger Inhibition subscale included five items and measured the degree to which participants turned emotion inward toward themselves (e.g., *"I get mad inside but I don't show it"*; $\alpha = .82$). The Anger Dysregulated Expression subscale included five items and measured the expression of emotion in culturally inappropriate, nonconstructive ways (e.g., *"I attack whatever it is that makes me mad"*; $\alpha = .73$). Items were rated on the following 5-point response scale: 1 = *not at all true*, 2 = *a little true*, 3 = *somewhat true*, 4 = *very true*, 5 = *extremely true*. Items for the Anger Emotion Regulation Coping scale were recoded such that higher scores indicate poor anger regulation and greater anger inhibition.

Data Analytic Strategy

Descriptive Statistics

The percentage of participants endorsing depressive and anxiety symptoms were calculated in SPSS 26 (IBM Corp., 2019). The calculation of descriptive statistics for latent profile indicators, auxiliary variables, and correlations between all variables were conducted in Mplus version 8 (Muthén & Muthén, 2017).

Confirmatory Factor Analyses

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An initial step prior to conducting the LPAs was to determine the factor structure for depressive (i.e., CDI) and anxiety (i.e., RCMAS) symptoms using confirmatory factor analyses (CFAs). This step was needed as prior studies with samples of predominantly African American/Black youth identified factor structures for the CDI and RCMAS that differed from those identified by the scale developers (CDC: Kovacs, 1992; RCMAS: Reynolds & Richmond, 1978). For the current study, the fit of the factor structure tests using CFAs were assessed using Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and by examining the factor loadings for the items. For the CFI, Hu and Bentler (1999) designated a cutoff value close to 0.95 for good fit and 0.90 for adequate fit while for RMSEA, Browne and Cudeck (1993) and McCallum et al. (1996) recommended 0.01, 0.05, and 0.08 to indicate excellent, good, and adequate fit respectively.

For the CDI, one-, three-, five-, and six-factor models were assessed for fit based on previous study findings for the CDI (Steele et al., 2006; Taylor et al., 2014). A one-factor higher order model was run to assess fit for an overall depression factor. The five- (Steele et al., 2006) and six-factor (Taylor et al., 2014) models were supported by prior studies of African American youth living in low-income areas, and one three-factor model was assessed based on the high correlations found by Steele and colleagues (2006) on three dimensions of the CDI (anhedonia, mood, and self-esteem). The five-factor model represented the original scale developed by Kovacs (1992).

For the RCMAS, one-, three-, and four-factor models were run to assess for fit based on previous study findings (Boyes & Culver, 2013; White & Farrell, 2001). A one-factor higher order model was run to assess fit for an overall anxiety factor. The three-factor model was the original factor structure developed by Reynolds and Richmond (1978). Two four-factor models

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were run based on the expert-derived four-factor model by White and Farrell (2001) and the four-factor model supported by Boyes and Culver (2013).

Latent Profile Analyses

Patterns of anxiety and depression symptoms were examined via LPA in Mplus version 8 (Muthén & Muthén, 1998-2017). LPA is a multivariate normal mixture model that allows for the identification of subgroups (i.e., profiles) within a single population using a model with indicator variables that are believed to distinguish the subgroups (Berlin, Williams, & Parra, 2013; Bauer & Shanahan, 2007). In the proposed study, LPA was used to identify hypothesized subgroups of adolescents whose profile membership differed based on patterns of anxiety and depressive symptoms. Based on the results of the CFAs, this model was built using ten indicator variables (i.e., CDI - dysphoria, social problems, externalizing problems, self-deprecation, school problems, biological dysregulation, and RMSEA - social evaluation, worry, affective response, and physiological symptoms/sleep problems).

Model fit statistics, subgroup size considerations, and theory consistent with recommendations (Masyn, 2013; Nylund, Asparouhov, & Muthén, 2007) were used to decide the optimal number of subgroups. Solutions with k number of subgroups were tested sequentially (k , $k+1$, etc.) and the resulting solutions were assessed based on fit indices. All viable models for comparison were identified, and adding further subgroups was no longer necessary when a k -profile model was not identified even after increased starts or inclusion of start values from earlier solutions (e.g., LRTSTARTS method using $k - 1$, $k - 2$, etc.). Model identification was indicated by poor replication of the best log-likelihood, a condition number less than 10^{-6} , and/or a substantial number of unperturbed start values that did not converge. If one of the subgroups only included a small proportion of the sample (i.e., less than 5%), the essential means and

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interpretation of the latent profile becomes limited. In the current study, models with one or more subgroups that comprised less than 5% of the data were considered lacking in empirical identification and therefore, additional $k + 1$ models were not necessary.

The proportion of individuals within each subgroup is important in determining how meaningful each subgroup is within a solution. The proportion of individuals was considered in the enumeration process in order to ensure each subgroup is truly distinct (i.e., face and content validity). It was also essential to incorporate theory and previous research findings in the enumeration process. For instance, if a three and four-profile solution are similar across fit indices but the four-profile solution identifies a subgroup that includes a very small proportion of the sample, the meaningfulness of the subgroup should be considered relative to previous research, relevant theory, and the research question(s).

Indices of relative fit that were examined across solutions with different numbers of profiles for the current study included the log-likelihood value, Bayesian information criterion (BIC; Sclove, 1987), sample-size adjusted BIC, and entropy. The log-likelihood is maximized by the estimation algorithm and is the basis for the BIC (Nylund et al., 2007). A higher log-likelihood value indicates a better fitting model. The BIC measures goodness of fit in a model and takes into account the number of parameters and the number of observations (Nylund et al., 2007). The sample-adjusted BIC takes into account the sample size and larger samples receive a smaller penalty (Nylund et al., 2007). Nylund and colleagues have concluded that the BIC is superior to other information criteria statistics while noting that the sample-adjusted BIC correctly identified the number of subgroups more consistently across different models and sample sizes. Entropy values range from 0 to 1, with values closer to 1 indicating greater

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accuracy in classification. Values less than 0.6 indicate poor classification quality and entropy will affect latent profile enumeration below this value.

The significance of likelihood ratio tests was also used as an indicator of relative model fit. The p -value produced by likelihood ratio tests represents the increase in model fit between the $k - 1$ profile model and the k -profile model (Nylund et al., 2007). A small probability ($p < .05$) indicates that that $k - 1$ model should be rejected in favor of the k -profile model. The significance of the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000) and the Lo-Mendell-Rubin likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001) were considered in the current study. Nylund and colleagues (2007) found that the BLRT generally outperformed other likelihood ratio tests with simulated data but often continues to be significant across all k -profile models with real data. This may be because the BLRT depends on distributional and model assumptions. The LMR-LRT is based on variance of the parameter estimates, which are robust and valid under different model and distributional assumptions. The LMR-LRT was included as an additional index of comparative fit between profile models in the current study despite some findings of this index being more sensitive to small sample size (Nylund et al. 2007).

Full-information maximum likelihood estimation with robust standard errors (FIML) was used to account for missing data in the profile analysis to allow model parameters to be estimated based on all available data (i.e., individuals with partial missing data will not be excluded from the analyses; Schafer & Graham, 2002). The use of FIML provides acceptable estimates when data is non-normally distributed, when data is missing at random, and for modest sample sizes (Muthén & Asparouhov, 2002; Yuan & Bentler, 2000).

Auxiliary Variable Analyses

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After the optimal number of profiles had been identified, a model was run to examine concurrent relations of the auxiliary variables with profile membership. Covariates and distal factors are often called auxiliary variables and they provide a context for understanding more about the latent profiles. Various approaches have been proposed for examining these relations; the modified one-step Bolck-Croon-Hagenaars method (BCH; Asparouhov & Muthén, 2014; Bolck, Croon, & Hagenaars, 2004) has been supported for examining associations with variables. Other approaches to comparing profiles on auxiliary variables (e.g., 3-step method; Asparouhov & Muthén, 2014) included entering auxiliary variables in the last stage of analyses when the latent variables can shift substantially and invalidate the results (Asparouhov & Muthén, 2014). The BCH method is more resistant to shifts in latent profiles because it uses a weighted multiple group analysis in which groups correspond to latent profiles (Bakk & Vermunt, 2014). Thus, the BCH method was used in the proposed study to examine associations between profile membership and five auxiliary variables (i.e., student-teacher relationships, student-student relationships, anger regulation coping, anger inhibition, and anger dysregulated expression). Concurrent relations between a) school interpersonal relationships and profile membership and b) emotion regulation and profile membership were examined using this method.

Results

Descriptive Statistics

Based on standard scoring of the CDI, a clinical cut-off score of 20 is generally accepted (Kovacs, 1992) in community samples with more nuanced research supporting tiered cut-off scores for mild symptoms of depression (i.e., scores greater than or equal to 15), moderate symptoms (i.e., scores greater than or equal to 20), and severe symptoms (i.e., scores greater than or equal to 25; Bang, Park, & Kim, 2015). For the RCMAS, clinically significant symptoms are

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indicated by scores of 19 or greater for the 28-item measure, or alternatively have been indicated by scores equal to or greater than 1 standard deviation above the mean (Reynolds & Richmond, 1978; Stallard, Velleman, Langsford & Baldwin, 2001). In the current sample, 18.4% of adolescents endorsed depressive symptom scores of 15 or greater (mild), 5.1% endorsed depressive symptom scores of 20 or greater (moderate), and 1.9% endorsed depressive symptoms scores of 25 or greater (severe). Additionally, 8.9% of the current sample endorsed anxiety symptoms scores of 19 or greater and 22.2% endorsed symptom scores one standard deviation above the mean (i.e., above 13; $M = 6.9$, $SD = 5.99$).

Positive correlations were found between all depressive symptoms with the exception of the relation between dimensions of dysphoria and school problems (See Table 1) and all anxiety dimensions were positively correlated with one another. Dysphoria (CDI) and biological dysregulation (CDI) were positively correlated with all anxiety symptom dimensions and the social evaluation dimension of the (RCMAS) was positively correlated with all depressive symptom dimensions. The social problems dimension of the (CDI) was positively correlated with worry (RCMAS; $r = .21$, $p < .01$) and physiological/sleep problems (RCMAS; $r = .46$, $p < .01$). Physiological/sleep problems (RCMAS) was also positively correlated with externalizing (CDI; $r = .21$, $p < .01$), self-deprecation (CDI; $r = .26$, $p < .01$), and biological dysregulation (CDI; $r = .49$, $p < .01$) dimensions.

For the auxiliary variables, student-teacher relationships were negatively correlated with the externalizing ($r = -.19$, $p < .05$), self-deprecation ($r = -.18$, $p < .01$), and school problems ($r = -.23$, $p < .01$) dimensions of the CDI; school problems was also negatively correlated with student-student relationships ($r = -.18$, $p < .05$). Anger emotion regulation coping was positively correlated with all the depressive symptom dimensions except self-deprecation. Anger inhibition

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was positively correlated with self-deprecation ($r = .22, p < .01$) and anger dysregulated expression was positively correlated with the externalizing ($r = .38, p < .01$), school problems ($r = .30, p < .01$), and biological dysregulation ($r = .17, p < .05$) dimensions of the CDI.

For anxiety symptoms, student-teacher relationships were positively correlated with worry ($r = .22, p < .01$) and affective response ($r = .20, p < .05$); student-student relationships were also positively correlated with affective response ($r = .21, p < .05$). Anger emotion regulation coping and anger dysregulated expression were positively correlated with affective response ($r = .24, p < .01$ and $r = .34, p < .01$ respectively) and physiological/sleep problems ($r = .21, p < .01$ and $r = .23, p < .01$ respectively). Anger inhibition was positively correlated with worry ($r = .24, p < .01$) and anger dysregulated expression was positively correlated with social evaluation ($r = .29, p < .01$). No significant correlations were found between school interpersonal relationship variables and emotion regulation variables.

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Table 1. *Correlations, means, and standard deviations for depression, anxiety, and auxiliary variables.*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Dysphoria (CDI)	--														
2. Social Problems (CDI)	.56**	--													
3. Externalizing (CDI)	.24**	.37**	--												
4. Self-deprecation (CDI)	.55**	.48**	.39**	--											
5. School Problems (CDI)	.11	.25**	.83**	.30**	--										
6. Biological Dysregulation (CDI)	.57**	.48**	.31**	.41**	.19*	--									
7. Social Evaluation (RCMAS)	.33**	.39**	.41**	.32**	.33**	.39**	--								
8. Worry (RCMAS)	.22**	.20**	.09	.08	.05	.38**	.62**	--							
9. Affective Response (RCMAS)	.18*	.08	.08	.03	-.01	.20*	.45**	.44**	--						
10. Physiological & Sleep Problems (RCMAS)	.44**	.48**	.25**	.30**	.17	.51**	.66**	.57**	.46**	--					
11. Student-student Relationships	-.04	-.07	-.15	-.10	-.18*	-.11	.03	.13	.19*	-.02	--				
12. Student-teacher Relationships	-.02	-.12	-.21*	-.14	-.24**	-.07	-.03	.22**	.20*	.03	.84**	--			
13. Anger Emotion Regulation Coping	.18*	.20*	.30**	.07	.22	.19*	.13	.003	.24*	.21**	-.07	-.07	--		
14. Anger Inhibition	.08	.01	-.04	.23	-.01	.06	.11	.25**	.08	.08	.06	.11	-.49**	--	
15. Anger Dysregulated Expression	.16	.11	.39**	.17	.29**	.17*	.29**	.08	.33**	.22**	.12	.13	.40**	-.14	--
<i>M</i>	1.03	1.24	1.72	.77	.91	1.06	2.42	1.45	1.06	1.94	16.01	25.27	10.15	8.53	9.15
<i>SD</i>	1.59	1.37	1.90	1.19	1.09	1.31	2.40	1.47	.98	2.13	4.92	8.12	2.38	2.52	2.50

Note. * $p < .05$. ** $p < .01$.

Confirmatory Factor Analyses

For the CDI, one-, three-, five-, and six-factor models were run. The six-factor model best fit the data and included the following subscales: (a) dysphoria, (b) social problems, (c) externalizing, (d) self-deprecation, (e) biological dysregulation, and (f) school problems. The six-factor model fit the data well, $\chi^2 (155) = 191.26$, $p = .03$, (CFI = .96; RMSEA = .04), and was a better fit than: (a) the one-factor model, $\chi^2 (299) = 401.13$, $p = .00$, (CFI = .91; RMSEA = .05), the three-factor model, $\chi^2 (296) = 401.13$, $p = .00$, (CFI = .92; RMSEA = .05), and the five-factor model, $\chi^2 (289) = 384.01$, $p = .00$, (CFI = .93; RMSEA = .04). Therefore, the six-factor model was used for the LPAs.

Table 2. *CFA model fit indices for the CDI*

Model	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA
1 Factor	409.09	299	>.00***	0.913	0.046
3 Factor	401.13	296	>.00***	0.917	0.045
5 Factor	384.01	289	>.00***	0.925	0.044
6 Factor	191.26	155	0.025*	0.959	0.037

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 172$.

Table 3. *Children's Depression Inventory Items (CDI) (Kovacs, 1992)*

Dimension	
<i>Dysphoria (4 items)</i>	
Item 1:	Item 10 (recode):
1 = I am sad once in a while	1 = Things bother me all the time
2 = I am sad many times	2 = Things bother me many times
3 = I am sad all the time	3 = Things bother me once in a while
4 = Skip	4 = Skip
Item 9 (recode):	Item 19:
1 = I feel like crying everyday	1 = I do not feel alone
2 = I feel like crying many days	2 = I feel alone many times
3 = I feel like crying once in a while	3 = I feel alone all the time
4 = Skip	4 = Skip
<i>Social Problems (4 items)</i>	
Item 4:	Item 20 (recode):
1 = I have fun in many things	1 = I never have fun at school
2 = I have fun in some things	2 = I have fun at school once in a while

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3 = Nothing is fun at all

4 = Skip

Item 11:

1 = I like being with people

2 = I do not like being with people many times

3 = I do not want to be with people at all

4 = Skip

3 = I have fun in school many times

4 = Skip

Item 21:

1 = I have plenty of friends

2 = I have some friends, but I wish I had more

3 = I do not have any friends

4 = Skip

Externalizing (3 items)

Item 5 (recode):

1 = I am bad all the time

2 = I am bad many times

3 = I am bad once in a while

4 = Skip

Item 26:

1 = I get along with people

2 = I get into fights many times

3 = I get into fights all the time

4 = Skip

Item 25:

1 = I usually do what I am told

2 = I do not do what I am told most times

3 = I never do what I am told

4 = Skip

Self-Deprecation (4 items)

Item 7 (recode):

1 = I hate myself

2 = I do not like myself

3 = I like myself

4 = Skip

Item 23 (recode):

1 = I can never be as good as other kids

2 = I can be just as good as other kids if I want to

3 = I am just as good as other kids

4 = Skip

Item 13:

1 = I look O.K.

2 = There are some bad things about my looks

3 = I look ugly

4 = Skip

Item 24 (recode):

1 = Nobody really loves me

2 = I am not sure if anybody loves me

3 = I am sure that somebody loves me

4 = Skip

School Problems (2 items)

Item 14 (recode):

1 = I have to push myself all the time to do my schoolwork

2 = I have to push myself many times to do my schoolwork

3 = Doing my schoolwork is not a big problem

4 = Skip

Item 22:

1 = My schoolwork is alright

2 = My schoolwork is not as good as before

3 = I do very badly in subjects I used to be good in

4 = Skip

Biological Dysregulation (3 items)

Item 15 (recode):

1 = I have trouble sleeping every night

2 = I have trouble sleeping many nights

Item 17 (recode):

1 = Most days I do not feel like eating

2 = Many days I do not feel like eating

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3 = I sleep pretty well

4 = Skip

Item 16:

1 = I am tired once in a while

2 = I am tired many days

3 = I am tired all the time

4 = Skip

3 = I eat pretty well

4 = Skip

Excluded items: 2, 3, 6, 8, 12, 18

For the RCMAS, one-, three-, and four-factor models were tested. Both the four-factor expert-derived model (White and Farrell, 2001) and the four-factor model proposed by Boyes and Culver (2013) were tested. The four-factor model identified by Boyes and Culver (2013) fit the data well, $\chi^2(344) = 381.96$, $p = .08$, (CFI = .98; RMSEA = .03), and was a better fit than the one-factor, $\chi^2(350) = 398.20$, $p = .04$, (CFI = .97; RMSEA = .03), and three-factor, $\chi^2(347) = 389.83$, $p = .06$, (CFI = .98; RMSEA = .03) models. Chi-square difference testing indicated no significant differences between the original three-factor model (Richmond & Reynolds, 1978), the expert-derived four-factor model (White & Farrell, 2001), and the four-factor model proposed by Boyes and Culver (2013) (See Table 4). Chi-square difference testing between the expert-derived four-factor model (White & Farrell, 2001), and the four-factor model proposed by Boyes and Culver (2013) were not conducted as the two models were not nested. However, the Boyes and Culver (2013) four-factor model provides a theoretically meaningful model of anxiety for African American/Black youth with the inclusion of a separate social evaluation factor and a physiological symptoms/sleep problems factor. It was therefore selected as the final model.

Table 4. *CFA model fit indices and chi-square difference tests for the RCMAS*

Model	χ^2	df	p	CFI	RMSEA	Model	$\Delta\chi^2$	Δdf
1 Factor	398.20	350	0.038*	0.972	0.029		--	--
3 Factor	389.83	347	0.056	0.975	0.027	1 vs 3	3.10	2
4 Factor	384.22	344	0.067	0.977	0.026	3 vs 4	5.95	3
ALT 4 Factor	381.96	344	0.077	0.978	0.026	3 vs ALT 4	7.42	3

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. $n = 167$.

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Table 5. *Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 1978)*

Dimension	
<i>Social Evaluation (9 items)</i>	
Item 1	I have trouble making up my mind
Item 3	Others seem to do things easier than I can
Item 5	I worry a lot of the time
Item 8	I worry about what my parents will say to me
Item 9	I feel like others do not like the way I do things
Item 12	I feel alone even when there are people with me
Item 18	Other children are happier than I am
Item 24	It is hard for me to keep my mind on my schoolwork
Item 27	A lot of people are against me
<i>Worry (6 items)</i>	
Item 2	I get nervous when things do not go the right way
Item 6	I am afraid of a lot of things
Item 11	I worry about what other people will think of me
Item 17	I worry about what is going to happen to me
Item 21	I fear someone will tell me I do things the wrong way
Item 28	I often worry about something bad happening to me
<i>Affective Response (3 items)</i>	
Item 7	I get mad easily
Item 14	My feelings get hurt easily
Item 20	My feelings get hurt easily when I am fussed at
<i>Physiological and Sleep Problems (10 items)</i>	
Item 4	Often I have trouble getting my breath
Item 10	It is hard for me to sleep at night
Item 13	Often I feel sick to my stomach
Item 15	My hands feel sweaty
Item 16	I am tired a lot
Item 19	I have bad dreams
Item 22	I wake up scared some of the time
Item 23	I worry when I go to bed at night
Item 25	I wiggle in my seat a lot
Item 26	I am nervous

Missing Data

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The data set used for LPAs contained cases with missing data on all variables. These cases comprised 13.78% of the full sample and were not included in the analyses, resulting in a final sample size of 169. Additional 14 missing data patterns were identified as missing at random, therefore, full information maximum likelihood (FIML) estimation was used to allow model parameters to be estimated based on all available data.

Latent Profile Analyses

Model fit indices for a series of one- to five-profile solutions were compared to identify the number of distinct subgroups that best represented the heterogeneity of the individual response patterns for the 10 dimensions representing depressive and anxiety symptoms (see Table 6 for model fit indices). The BIC and aBIC continued to decrease as the number of subgroups increased. The BLRT was significant across all k-profile models up to and including a model with five subgroups. The lack of significance of the LMR-LRT for the three-profile model may indicate that the addition of another subgroup (i.e., from the two-profile to the three-profile model) did not significantly improve the overall model fit. However, the current recommended practice for analyses with a smaller sample size and lack of plateau in terms of decreases in IC values from the k-profile model to the $k + 1$ model (i.e., the “elbow” on the scree plot of the IC values; Masyn, 2013) have suggested the reliance on other fit indices (i.e., BIC, BLRT, smallest profile size) for identification of model solutions. A decreased BIC, aBIC, smallest profile $> 5\%$, and entropy suggest that a three-profile model best represented the heterogeneity within the sample. The three-profile model also aligns with previous research (Barbarin & Soler, 1993; Choi & Park, 2006; Iwata et al., 2002; Wadsworth et al., 2001) and theory (Gaylord-Harden, Elmore, Campbell, & Wethington, 2011). The smallest subgroup of the three-profile model

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represented 16% of the sample, which is large enough to suggest that it adds substantive meaning to the two-profile model.

Examination of the individual profiles (Figure 1) revealed the presence of a Low depressive/Low anxiety symptom group (Profile 1) which included 107 youth (63%), High Externalizing/Moderate School and Social Evaluation problems group (Profile 2) which included 25 youth (16%), and High Social Evaluation and Physiological/Sleep anxiety problems group (Profile 3) which included 37 youth (21%). Profile 2 included high levels of externalizing depressive symptoms (e.g., “*Am I bad,*” “*Do I do what I am told*”) with moderate levels of school problems (e.g., “*I have to push myself to do my schoolwork*”) and moderate social evaluation difficulties (e.g., “*A lot of people are against me,*” “*I worry about what my parents will say to me*”). Profile 3 included high levels of anxiety symptoms including social evaluation problems (e.g., “*A lot of people are against me,*” “*I worry about what my parents will say to me*”) and high levels of physiological and sleep problems (e.g., “*Often I feel sick to my stomach,*” “*It is hard for me to sleep at night*”).

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Table 6. *Fit Indices for unconstrained LPA Models.*

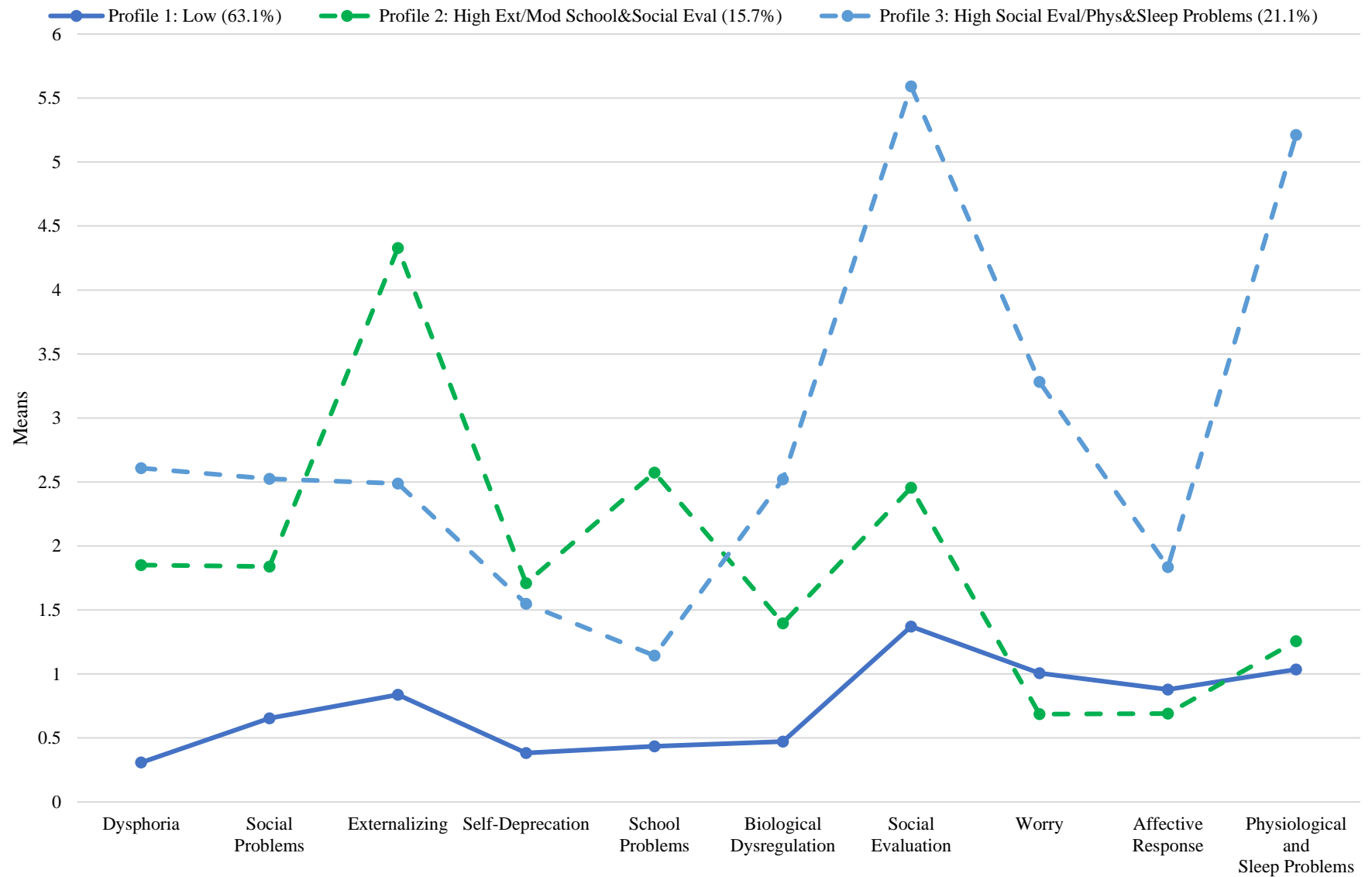
	<i>k</i>	Par	LL	AIC	BIC	aBIC	VLMR- LRT	LMR- LRT	BLRT	Entropy	condition#	Smallest profile	
							<i>p-value</i>	<i>p-value</i>	<i>p-value</i>			n	%
Diagonal, Profile Invariant	1	20	-2952.4	5944.8	6007.4	5944.1	NA	NA	NA	NA	.00827000	169	100%
	2	31	-2737.7	5537.4	5634.4	5536.2	.002	.002	.00000000	.953	.00878000	46	27%
	3	42	-2665.0	5414.0	5545.4	5412.4	.218	.222	.00000000	.942	.00335000	25	16%
	4	53	-2621.0	5347.9	5513.8	5346.0	.510	.515	.00000000	.946	.00022300	10	6%
	5	64	-2576.6	5281.2	5481.5	5278.8	.571	.573	.00000000	.934	.00000046	11	7%
Diagonal, Profile Varying	1	20	-2952.4	5944.8	6007.4	5944.1	NA	NA	NA	NA	.00827000	169	100%
	2	41	-2569.2	5220.5	5348.8	5219.0	0.031	0.0319	.00000000	0.919	.00047400	78	46%
	3	62	-2468.0	5060.0	5254.0	5057.7	0.572	0.5741	.00000000	0.933	.00000000	48	28%
Non-Diagonal, Profile Invariant	1	65	-2562.8	5255.6	5459.1	5253.3	NA	NA	NA	NA	.00001840	169	100%
	2	76	-2509.6	5171.2	5409.1	5168.5	0.1063	0.1114	.00000000	0.985	.00000704	19	11%
	3	87	-2471.6	5117.2	5389.5	5114.0	0.1341	0.139	.00000000	0.983	.00000555	12	7%
	4	98	-2435.7	5067.4	5374.1	5063.8	.155	.158	.00000000	.979	.00000000	2	1%
Non-Diagonal, Profile Varying	1	65	-2562.8	5255.6	5459.1	5253.3	NA	NA	NA	NA	.00001840	169	100%
	2	131	-2330.5	4923.1	5333.1	4918.3	0.0346	0.0353	0	0.943	.00000000	96	57%

N = 169

Note: BIC = Bayesian Information Criterion; aBIC = Sample size adjusted BIC; LMR-LRT = Lo-Mendell-Rubin likelihood ratio test; BLRT = Bootstrap likelihood ratio test; LRTs and Entropy not applicable for 1-profile models.

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Figure 1. Latent profile analysis (LPA) means plot for 3-profile model.

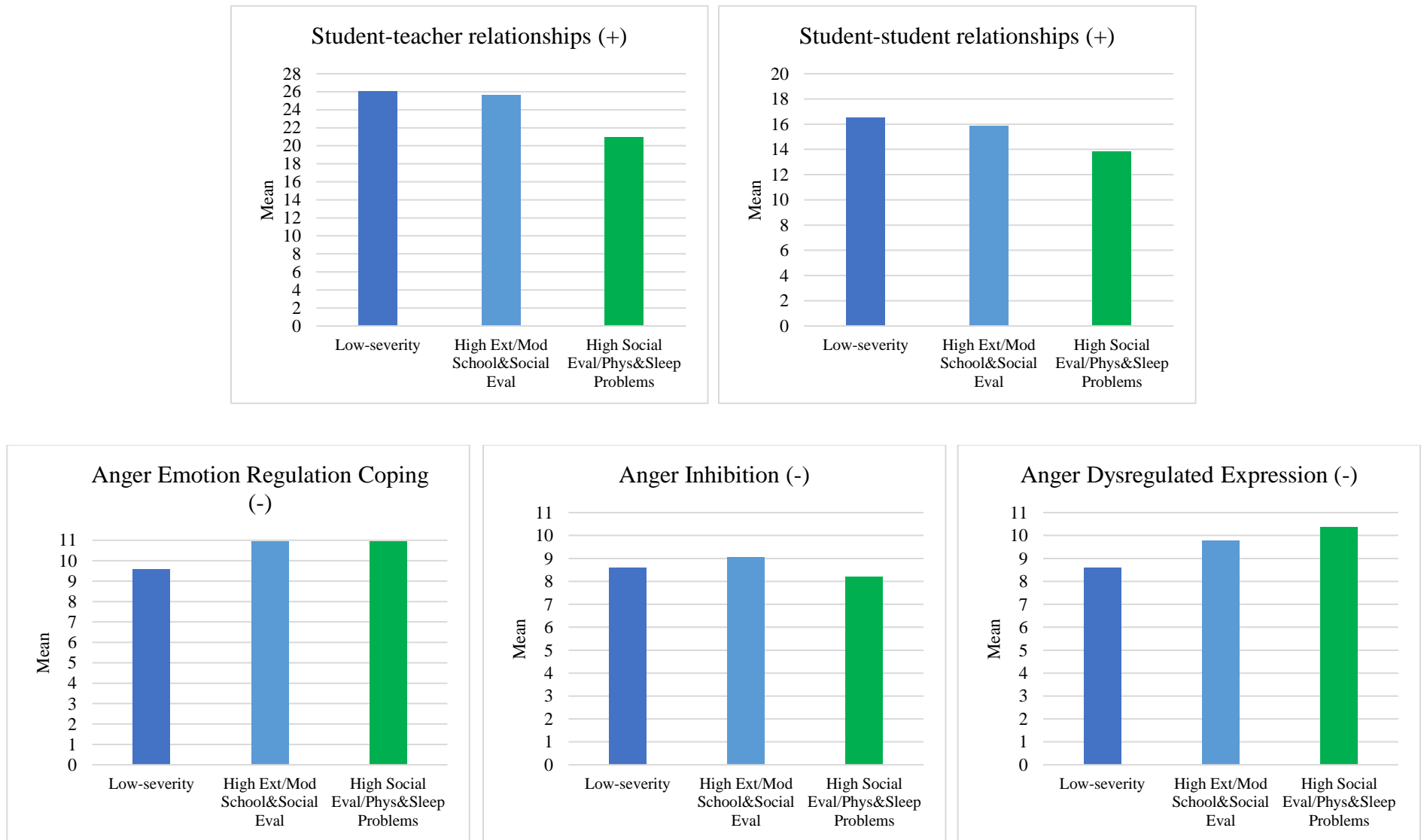


Covariates and Auxiliary Variable Analyses

Results indicated no significant profile differences based on intervention condition, $\chi^2 (1) = -.72, p = .19$, gender, $\chi^2 (1) = -.16, p = .75$, grade, $\chi^2 (2) = -.67, p = .09$, or age, $\chi^2 (2) = .48, p = .20$. The modified one-step Bolck-Croon-Hagenaars method (BCH; Asparouhov & Muthén, 2014; Bolck, Croon, & Hagenaars, 2004) did reveal significant relations between profile membership and 1) school interpersonal relationships and 2) emotion regulation. Student-student relationship scores were significantly higher (indicating more positive relationships) for Profile 1 compared to Profile 3, $\chi^2 = 5.43, p = .02$. Student-teacher relationship scores were significantly higher (indicating more positive relationships) for Profile 1, compared to Profile 3, $\chi^2 = 8.03, p = .005$, and for Profile 2 compared to Profile 3, $\chi^2 = 5.16, p = .02$. Anger Emotion Regulation Coping scores (e.g., *“I can stop myself from losing my temper,” “When I am mad, I control my temper”*; reverse-coded such that high scores indicate greater difficulty with emotion regulation coping) were significantly higher (indicating more difficulty regulating anger) for Profile 2, $\chi^2 = 11.55, p = .001$, and Profile 3, $\chi^2 = 4.30, p = .04$, compared to Profile 1. Anger Dysregulated Expression scores (e.g., *“I do things like slam doors when I am mad,” “When I get angry, I take it out on other people”*) were significantly higher (indicating more difficulty regulating anger) for Profile 2, $\chi^2 = 5.81, p = .02$, and Profile 3, $\chi^2 = 6.82, p = .01$, compared to Profile 1. There were no significant differences for Anger Inhibition scores (e.g., *“I hold my anger in,” “I get mad inside but I don’t show it”*) between profiles.

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Figure 2. Relations between Profile Membership and Auxiliary Variables.



Discussion

The present study identified patterns of depressive and anxiety symptoms among a sample of African American early adolescents living in high-burden communities and examined relations between these patterns and factors including school interpersonal relationships and three aspects of emotion regulation. The three profiles of depressive and anxiety symptoms found (i.e., Profile 1 - low severity, Profile 2 – high externalizing/moderate school and social evaluation difficulties, and Profile 3 – high social evaluation and physiological/sleep difficulties) were consistent with symptom presentations for depression and anxiety found in prior studies of African American adolescents (Choi & Park, 2006; Iwata et al., 2002; Kingery et al., 2007; White & Farrell, 2006). Further, the three profiles were differentiated based on quality of school interpersonal relationships and emotion regulation.

The present study contributed to the literature in several ways. First, as an initial step, competing factor structures were tested for the CDI and RCMAS including factor structures for each measure that were supported in samples of African American/Black adolescents as well as the original factor structure developed for each measure (Boyes & Culver, 2013; Kovacs, 1992; Steele et al., 2006; Taylor et al., 2014; Reynolds & Richmond, 1978; White & Farrell, 2001). CFA results identified a four-factor model for the RCMAS (Boyes & Culver, 2013) and a six-factor model for the CDI (Taylor et al., 2014), each supported in prior studies focusing on African American/Black adolescents, as best fitting the data. Second, the present study identified patterns of combined depressive and anxiety symptoms among African American early adolescents living in high-burden communities which provided novel information about the co-occurrence of these symptoms and highlighted two unique symptom profiles (Profile 2 – high externalizing/moderate school and social evaluation difficulties and Profile 3 – high social

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evaluation and physiological/sleep difficulties). Finally, findings highlighted that adolescents represented in these profiles perceived lower quality student-student and/or student-teacher relationships at their middle school, and reported elevated rates of anger dysregulated expression and difficulties with anger emotion regulation coping as compared to adolescents who were represented in the low severity profile.

The prevalence rates of anxiety and depression for the current study were slightly below the rates reported in previous studies (Kessler et al., 2001; Merikangas et al., 2010). The prevalence of mild symptoms of depression in the current study (18.4%) is similar to the national reports that 20% of youth endorse the onset of depressive symptoms during adolescence (Kessler et al., 2001). Only 5.1% of the current sample endorsed moderate symptoms and 1.9% endorsed severe symptoms of depression in the clinical range. For anxiety symptoms, 9% of participants endorsed symptoms of anxiety in the clinically significant range which is less than national reports that 30% of youth endorse rates of anxiety severe enough for clinical diagnosis (Merikangas et al., 2010). However, in the current study, prevalence of anxiety symptoms was still within the range of diagnosis rates for children and adolescents (7.1% to 28.2%) (Vasey, Bosmans, & Ollendick, 2014).

Factor Structure of Anxiety and Depression

The two best fitting factor structures for the CDI and RCMAS, respectively, were consistent with prior research that found increased endorsement of externalizing depressive symptoms (e.g., anger, aggression, and irritability) and physiological/somatic anxiety symptoms (e.g., headaches and stomach pain) among African American youth (Choi & Park, 2006; Iwata et al., 2002; Kingery et al., 2007; White & Farrell, 2006). For the CDI, the final six-factor model retained dimensions of depressive symptoms (i.e., negative mood, social problems, and negative

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self-esteem) identified by the scale developer (Kovacs, 1992) and dimensions of depressive symptoms identified among African American youth (i.e., externalizing, school problems, and biological dysregulation; Taylor et al., 2014). Similarly, for the RCMAS, the final four-factor model included symptom dimensions similar to those identified by Reynolds and Richmond (1978) of worry and physiological anxiety, and factors identified among samples of African American/Black youth (i.e., social evaluation and affective response; Boyes & Culver, 2013). These findings highlighted the importance of initially conducting CFAs to determine if competing factor structures identified for African American adolescents fit the data better than the original factor structure developed for the CDI and RCMAS. This is particularly important prior to conducting LPAs as the identified dimensions of depressive and anxiety symptoms form the starting point for these analyses.

Profiles of Anxiety and Depression

Previous studies examining prevalence rates, risk factors, and outcomes of depressive and anxiety symptoms have often used diagnostic cutoffs for examining internalizing problems (i.e., depressive/anxiety disorders; Hammen & Rudolph, 2003). Few studies to date have used person-centered analyses to allow for a dimensional perspective on profiles of anxiety and depressive symptoms in youth, and no studies have examined these patterns in African American youth. In addition, the use of dimensions of anxiety and depressive symptoms represented by factors rather than item-level analyses provided a novel lens through which to examine patterns of symptom presentation.

Based on theory and prior research, it was hypothesized that at least three distinct profiles of depressive and anxiety symptoms would be identified representing varying degrees of symptom severity. Results supported this hypothesis, and a three-profile solution was identified

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that included: (1) a low-severity depressive and anxiety symptom group (Profile 1; 63%), (2) a high externalizing/moderate school and social evaluation difficulties symptom group (Profile 2; 16%), and (3) a high social evaluation and physiological/sleep problems symptom group (Profile 3; 21%). These findings are consistent with prior LCA studies of depressive and anxiety symptoms that found no evidence of a depressive symptom-only or anxiety symptom-only group(s) (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001). The current study results emphasized the high comorbidity between depressive and anxiety symptoms in African American middle school students, and the importance of considering the co-occurring presentation of these symptoms. Similar to previous studies (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001), the largest percentage of the sample (63%) reflected low rates of both depressive and anxiety symptoms.

However, the remaining two profiles did not reflect merely general elevations in the severity of anxiety and depressive symptoms found in some prior research (i.e., profiles reflecting low, moderate, and severe levels of anxiety and depressive symptoms) (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001). Instead, they aligned with research and theories that described increased endorsement of externalizing symptoms of depression and physiological/somatic symptoms of anxiety in African American youth (Choi & Park, 2006; Iwata et al., 2002; Kingery et al., 2007; White & Farrell, 2006). Thus, a novel study finding is the nuanced separation between high externalizing depressive symptoms in Profile 2 and high physiological anxiety symptoms in Profile 3. However, there remained significant overlap in comorbid symptoms of anxiety and depression for both groups. Additional studies are needed to examine symptom presentations in similar samples of African American early adolescents before

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any concrete conclusions can be made about the presentation of co-occurring depressive and anxiety symptoms.

The literature to date has supported the role of stressful life experiences associated with poverty (e.g., fewer academic and economic opportunities and exposure to community violence) as a possible explanation for the presence of externalizing depressive symptoms (Cassidy & Stevenson, 2005; Grant, Katz, et al., 2004; Stevenson, Reed, Bodison, & Bishop, 1997) among youth living in high-burden communities. For racial/ethnic minority youth, broad societal influences (i.e., structural and interpersonal racism and discrimination) have been shown to facilitate thoughts (e.g., hostile attributions), feelings (e.g., anger), and behaviors (e.g., aggression) that are characteristic of externalizing problems (MacKinnon-Lewis et al., 1994; Tolan, Gorman-Smith, & Henry, 2003). Although the current study was unable to directly assess correlates reflecting societal influences, the patterns of depressive and anxiety symptoms identified are consistent with findings that highlighted endorsement of externalizing forms of distress as part of depression (Taylor et al., 2014). Cultural and contextual factors can play a critical role in the expression of somatic and physiological symptoms of depression and anxiety. Researchers highlighted that for African American youth living in communities with high rates of crime and violence, physiological complaints are more culturally sanctioned expressions of depression and anxiety and are viewed as more adaptive for masking vulnerabilities than sadness or low self-esteem (Reynolds et al., 2001; White & Farrell, 2006).

School Interpersonal Relationships

The third aim of the present study was to examine relations between profiles of depressive and anxiety symptoms and youths' perceptions of school interpersonal relationships. Perceptions of high-quality student-student relationships and student-teacher relationships at

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school can influence positive developmental outcomes by promoting positive perceptions and preventing internalizing symptoms (Roeser et al., 2000). The hypothesis that adolescents who reported higher versus lower quality of student-teacher relationships would be more likely to be members of a profile with lower rates of depressive and anxiety symptoms was partially supported. Adolescents in both the low severity and high externalizing/moderate school and social evaluation difficulties profiles reported significantly higher levels of positive student-teacher relationships at their school compared to adolescents in the high social evaluation and physiological/sleep difficulties profile. Additionally, adolescents in the low severity profile reported higher levels of positive student-student relationships at their school compared to adolescents in the high social evaluation and physiological/sleep difficulties profile.

The finding that adolescents in the low severity profile endorsed higher levels of positive student-student relationships and student-teacher relationships than youth in one or more of the profiles characterized by higher rates of depressive and anxiety symptoms is in line with previous research (Kurdi & Archambault, 2018; Pössel et al., 2013; Reddy et al., 2003; Way, Reddy, & Rhodes, 2007; Zee & Roorda, 2018). Facets of social-ecological theory suggest that adolescents who struggle with depression and/or anxiety often have low self-perceptions of their social standing with peers, parents, and other adults in their life, and may perceive their own and others relationships with students and teachers at school as less positive. Positive perceptions of student-teacher relationships and student-student relationships may act as promotive factors that contribute to resiliency as reflected in the endorsement of low levels of anxiety and depressive symptoms. Longitudinal studies have found support for promotive effects in that higher quality student-teacher relationships and student-student relationships predicted lower rates of

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depressive (Colarossi & Eccles, 2003; Huang, Lewis, Cohen, Prewett, & Herman, 2018; Reddy et al., 2003) and anxiety symptoms (Coyle & Malecki, 2018; Hendron & Kearney, 2016).

Youth who experienced more difficulties with social evaluation as well as physiological and sleep problems associated with anxiety (i.e., Profile 3) endorsed lower quality student-teacher relationships as compared to youth who experienced higher rates of externalizing depressive symptoms and moderate school and social evaluation problems (i.e., Profile 2). For some youth who live in high-burden communities, processes such as unfair treatment, discrimination, and feelings of disconnection from school may negatively impact their perceptions of support from teachers (Gregory & Winston, 2008). More specifically, these findings may indicate the differential role that difficulties with social evaluation and physiological/sleep problems play in perceptions of support from teachers. In particular, higher levels of social evaluation difficulties found among adolescents in Profile 3 as compared to Profile 2 may more strongly impact areas of self-esteem and perceptions of social identity (Lozada & Halberstadt, 2015; Nettles & Pleck, 1996). Longitudinal studies are needed to examine the directionality of these relations with larger samples of African American early adolescents living in a variety of socio-ecological contexts. Overall, the current study provided preliminary evidence of associations between the perceived quality of school interpersonal relationships and profiles of depressive and anxiety symptoms.

Emotion Regulation

Difficulties with emotion regulation coping skills, dysregulated anger expression, and anger inhibition can influence and be influenced by depressive and anxiety symptoms. The hypothesis that adolescents who reported lower rates of difficulty for each aspect of emotion regulation would be more likely to be represented in profiles with lower rates of depressive and

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anxiety symptoms was partially supported. Adolescents in Profile 1 (i.e., low severity) reported significantly lower levels of difficulty with anger emotion regulation coping and dysregulated anger expression compared to adolescents in Profile 2 and Profile 3. However, there were no significant differences in adolescents' reported levels of anger inhibition difficulties across the three profiles. Current study findings were consistent with prior research that showed emotion expression reluctance (e.g., low levels of anger emotion regulation coping) and poor emotion awareness (e.g., high levels of anger inhibition and anger dysregulated expression) were associated with higher rates of anxiety and depressive symptoms (Sendzik, Schafer, Samson, Naumann, & Tuschen-Caffier, 2017). Current study results suggested that higher levels of anxiety and depressive symptoms, despite the elevation of specific symptoms (e.g., high externalizing depressive symptoms in Profile 2 versus high physiological anxiety and sleep problems in Profile 3), are related to more difficulty with emotion awareness and expression.

However, the findings also lend insight into specific aspects of emotion awareness that were more strongly associated with patterns of depressive and anxiety symptoms in the current study. These findings may be linked to previous research by Dunbar and colleagues (2017) which suggested that African American youth experience parental socialization that both validates emotions and encourages suppression of emotional experiences to prepare youth for potential bias by different racial groups. In the current study, anger inhibition was not significantly related to profile membership which may mirror experiences of emotional validation by parents such that African American adolescents do not perceive a need to inhibit emotions (Dunbar et al., 2017). These indicators of suppressing emotional expression may stem from parental socialization practices and may be enhanced for African American adolescents in

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urban, low-income communities where higher levels of anger suppression has been linked with more favorable perceptions by adults (Thomas, Coard, Stevenson, Bentley, & Zamel, 2009).

In contrast, adolescents in the current study, regardless of their profile of moderate to higher rates of depressive and anxiety symptoms, experienced greater difficulty with anger emotion regulation coping and anger dysregulated expression. These results are consistent with previous research that showed positive relations between physiological hyperarousal during adolescence and difficulties with emotion regulation (Wilson, Barnes Holmes, & Barnes Holmes, 2014). The current study findings were also in line with findings from several studies focusing on African American youth. Specifically, participants who reported heightened externalizing symptoms of depression tended to show more anger, aggression, and irritability (Choi & Park, 2006; Iwata et al., 2002; Zeman, Shipman, & Suveg, 2002). Youth endorsing higher levels of externalizing depression symptoms as well as physiological anxiety symptoms may experience difficulties with expressing anger through healthy and effective coping strategies. As with school interpersonal relationships, longitudinal studies are needed to examine the directionality of the relations between emotion regulation strategies and profiles of depressive and anxiety symptoms in African American youth to better understand the potential risk and resilient nature of the constructs.

Limitations

Although the current study sought to address the limitations of prior work, it is not without limitations itself. The sample size of the current study is an inherent limitation in the examination and discovery of latent profiles. Although there are no specific parameters or minimum sample size deemed necessary based on the literature for running latent profile analyses, small sample size often creates greater difficulty when trying to find a good fitting

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model. For example, in the current study, one or more of the common fit indices used for LPAs was non-significant for a number of solutions (VMLR-LRT; LMR-LRT) which is likely due to the small sample size. In addition, the current sample was further limited in size due to missing data patterns present in the anxiety and depression measures. Therefore, a larger sample may have resulted in the identification of more profiles of depressive and anxiety symptoms.

The measures introduced another limitation to the current study. Empirical findings have been mixed about the validity of the CDI and RCMAS for African American youth (Brown, Meadows, & Elder, 2007; Kennard, Stewart, Hughes, Patel, & Emslie, 2006). An important step moving forward is the dissemination of well-validated measures of anxiety and depression for racial/ethnic minority youth. Greater dissemination of validated measures can help to close the gap between research and service disparities facing minority youth living in high-burden contexts. The widespread availability of free validated measures can also provide healthcare professionals the best screening and assessment tools to reach children and families most in need and least likely to seek out mental health treatment independently.

The current study sample was recruited from racial/ethnic minority youth attending schools that served urban, primarily low-income neighborhoods, yet, the study was limited in the ability to address specific factors for youth that may impact internalizing symptoms. Certain risk factors such as rates of exposure to community violence and experiences of structural and interpersonal racial discrimination can impact perceptions of control and threat by adolescents which can increase the risk of internalizing symptoms. The social disadvantage of concentrated poverty and exposure to stressful and adverse life events can also place African American youth living in high-burden communities at-risk for heightened internalizing symptoms. However, none of these factors were measured as part of the larger research project and therefore could not

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be used in the current study to assess their relation to patterns of depressive and anxiety symptoms.

Implication and Future Directions

The current study findings addressed an important gap in the literature about the presentation of depressive and anxiety symptoms in African American adolescents. Although empirical evidence and theory suggest that there are differences in the presentation of depressive and anxiety symptoms in African American youth as compared to other racial/ethnic groups, previous research has not used person-centered analyses to examine specific profiles of depressive and anxiety symptoms. African American youth were represented in three distinct profiles of depressive/anxiety symptom presentation. These findings showed that depressive and anxiety symptoms are highly comorbid during adolescence, and distinct symptom patterns are present.

These findings have important implications for measurement and interventions aimed at diagnosing, treating, and reducing depression and anxiety during early adolescents. Current measures commonly used to screen for anxiety and depressive symptoms during adolescence (e.g., Patient Health Questionnaire-9, Generalized Anxiety Disorders-7, CDI, Revised Children's Anxiety and Depression Scale) sometimes only assess certain symptoms of anxiety or depression or are used for diagnostic purposes. Clinical and research efforts use measures to screen for anxiety or depression that are often focused on clinically significant levels of anxiety or depressive symptoms (i.e., a number and/or severity of symptoms that would indicate clinical diagnosis of depression or anxiety). However, high rates of comorbidity and significant consequences exist for subclinical/subthreshold depressive and anxiety symptoms that warrant attention. The current study found no group of adolescents who reported depressive or anxiety

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symptoms alone, therefore, continued research on subthreshold symptoms of both anxiety and depression is essential to the further clinical conceptualization, treatment, and prevention of anxiety and depression.

Previous studies have aimed to address the limited validity and reliability of depression and anxiety measures on samples of African American youth to expand original validation and reliability studies which have typically been done using predominantly white, middle-class samples. Continued efforts to reinforce the use of measures validated specifically for African American youth is imperative. Of note, one review study by Brown and colleagues (2013) shed light on the possibility that the estimation method used for model fit analyses may account for the previous differences found in model fit (i.e., studies that found original factor structures to not be a good fit for African American samples). Therefore, the current study used recommended strategies (e.g., WLSMV estimation rather than ML) to ensure good model fit when looking at measure factors. Future studies should prioritize factor analyses based on the sample demographics and underlying theory being tested to analyze and select the factor structure that is most suited to the research question.

Longitudinal studies to examine the direction and effect of school interpersonal relationships and emotion regulation on symptom profiles of depression and anxiety are additional areas for further study. Variable-centered longitudinal studies have found significant associations between student-student relationships, student-teacher relationships, depression, and anxiety. PVEST and risk and resilience theory have supported the potential role of school interpersonal relationships as protective or promotive resource factors for positive adolescent development. Latent transition analyses may provide information about the stability of the identified profiles over time and the role of the quality of school interpersonal relationships as a

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predictor or consequence of the various symptom profiles. This could help to pinpoint areas for prevention and intervention for depression and anxiety. Researchers have acknowledged the need for longitudinal studies to assess the directionality and causality of relations between emotion regulation and internalizing symptoms (Sendzik et al., 2017). In addition, longitudinal studies examining the role of specific emotions (e.g., anger) that may be particularly helpful in providing context-specific findings to uncover aspects of risk and resilience for racial/ethnic minority youth. For example, due to misconceptions or misattributions of anger in African American youth (Thomas, Coard, Stevenson, Bentley, & Zamel, 2009; Barbarin et al., 2013; Halberstadt, Castro, Chu, Lozada, & Sims, 2018), continued examination of the role of emotion regulation for anger and other emotions (e.g., sadness) are needed to accurately identify strategies of emotion expression that may act as risk or protective factors. As such, minority youth can benefit from targeted interventions using emotion regulation and interpersonal skill-building tools that take culture and context into account to support adolescent development and success.

For treatment of anxiety and depression in African American youth, widening health disparities have led to greater need for improvements in addressing issues of culture and context in mental health services. Evidence-based treatments (EBT) for minority youth face dissemination challenges that result in continued unmet mental health needs (Kataoka, Novins, & Santiago, 2010). Evidence-based practice involves “the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences,” (American Psychological Association Presidential Task Force on Evidence-Based Treatment, 2006) though providers still debate over the conceptualization and implementation of cultural humility in mental health practice. Reviews of psychosocial treatment have been conducted to assess whether EBTs that have been predominantly tested with white middle-class clients can be

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generalized to racial/ethnic minority clients (Huey & Polo, 2008; Miranda et al., 2005). They have found good evidence supporting the effectiveness of cognitive-behavioral therapy (CBT) and interpersonal therapy (IPT) for African American youth (Miranda et al., 2005). Other approaches for implementing culturally sensitive evidence-based practice has focused on an iterative process of learning about sociocultural groups, practicing competent and theoretically consistent treatment, and devoting attention to themes that drive differences in client behavior (e.g., health beliefs, self-identification, individualism vs. collectivism, communication styles, therapy goals, and family structure; Pantalone, Iwamasa, & Martell, 2019).

Findings from the current study inform efforts to treat anxiety and depressive symptoms among African American youth living in under-resourced neighborhoods by adding to the theoretical conceptualization of depression and anxiety. For practitioners striving to provide culturally-sensitive treatment for African American youth, awareness of the presentation of patterns of co-occurring depression and anxiety symptoms characterized by higher levels of externalizing behaviors, school problems, social evaluation difficulties, and physiological/sleep problems can increase attunement to mental health needs for African American youth. Increased awareness of symptom presentation can lead to more effective screening and streamlining from symptom identification to treatment implementation and may reduce barriers to accessing care. Practitioners can also provide treatment tailored to specific symptoms of depression and anxiety that may be more prevalent in African American youth by acknowledging cultural and contextual factors (i.e., identification of risk and protective factors), building rapport and fostering a space for sharing of individual backgrounds and experiences (i.e., understanding self-identification and family structure), and adapting therapy goals to aid in reducing specific symptoms of anxiety and depression.

Conclusions

The present study findings supported distinct patterns of depressive and anxiety symptoms in a sample of African American early adolescents living in high-burden communities. Youth reported low-, moderate/high-, and high-severity depressive and anxiety symptoms with profiles reflecting specific combinations of higher rates of externalizing/social and school problems versus social and physiological/sleep problems. Results extended prior LCAs of anxiety and depressive symptoms that were conducted predominantly with samples of white youth (Ferdinand et al., 2005; van Lang et al., 2006; Wadsworth et al., 2001). Findings also indicated differences across profiles of depressive and anxiety symptoms based on the quality of school interpersonal relationships (i.e., student-student relationships and student-teacher relationships) and aspects of emotion regulation (i.e., emotion awareness and emotion expression). Further evidence of the patterns of anxiety and depressive symptoms identified in the current study is needed to support revisions in the conceptualization, treatment, and prevention of depression and anxiety, and to promote intervention efforts that are tailored to meet the specific needs of African American youth living in low-income contexts. Future research should consider addressing methodological limitations of the current study, such as examining profiles using larger samples of African American youth and including additional indices of risk for youth living in high-burden contexts.

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